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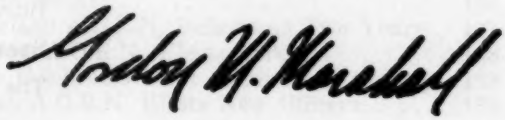
Foreword

HOSPITAL TOPICS since December 1949 has published a section devoted to the operating room supervisor and her associates. To provide the surgical staff with a permanent reference source of the important material published in 1952, this yearbook has been compiled.

Editorial matter presented in the O.R. Section is independently selected and prepared by the HOSPITAL TOPICS staff. The guidance of Carl W. Walter, M.D. and Dorothy Wysocki, R.N., both of the surgical staff of Peter Bent Brigham Hospital, Boston, is gratefully acknowledged.

Ethicon Suture Laboratories financially sponsors the O.R. Section and each year sends individual gift subscriptions to several thousand supervisors.



Gordon Marshall, Publisher

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Paper presented at the November meeting of the
New York City Association of Operating Room Nurses
By Dr. E. John Dolan, F.A.C.S.
New York City

Team Play in the Operating Room

Co-operation of the team depends much on the O.R. supervisor

TEAM play suggests group activity with one common purpose. It could be illustrated thus: Six nurses in an elevator, each going to different floors with different intents and purposes in mind. This is merely group activity. There is no one common purpose. No Team Play!

Team play could be illustrated thus: Six persons in an elevator, each going to the O.R. These six could be the surgeon, O.R. charge nurse, scrub nurse, circulating nurse, anesthetist, and orderly. These six have one common objective—the patient on the table for surgery. This is group activity with one objective. This is Team Play.

I believe the O.R. team is like a club; having regular members and associate members. The first group being the regular members, would include:

1. The surgeon
2. The O.R. charge nurse
3. The anesthetist
4. The scrub nurse
5. The circulating nurse
6. The orderly

The associate members would include:

1. The admitting clerk
2. The floor nurse
3. The house surgeon

We all know the reasons for the regular members but let me explain the addition of the second group.

The Admitting Clerk is important in that she should not admit too many patients for surgery on any one day.

The House Surgeon is important in that he makes the preliminary examination to discover any contra-indications to specific drugs, a particular type of anesthesia, and particularly, because he writes orders for pre-operative preparation and pre-operative medications.

The Floor Nurse is important in that all pre-operative orders are carried out and pre-operative medications are given on time so that the patient will not feel that he is being rushed and thus, enter the O.R. in a healthy mental state, devoid of fear and confusion.

Very definitely, this last group should, also, include our Supply Men who keep our instruments, drugs, and

Anesthetist

sutures up to date, as well as keep them in good supply and of excellent material.

The delegation of responsibilities and assignments is mandatory for perfect team play. I will not attempt to itemize all individual responsibilities for you all know them better than I do. They have been gone over many times. But for the sake of accentuating the subject, I will select just a few and try to demonstrate how the attitude of each person influences, either favorably or unfavorably, the attitude of the remaining members of the team.

First, The Surgeon! He may be the boss who has someone working under him to whom he gives orders, and be of no more use than that. Or, he may be a good executive whose paramount interest is how every one on the team can contribute his best towards the good of the patient. This, we must all remember, is the prime and only reason for hospitals, doctors, and nurses: the good of the patient.

Another of his responsibilities is to remember that each patient is different and that each surgical procedure will vary with each patient. He will discuss with the charge nurse any unusual procedure, instrument, drug, or stimulant which he may anticipate will be required, if it should differ from the routine or set-up of equipment usually prepared for him. By so doing, he will infuse the group with a high degree of team play and suggest, immediately, that he is a leader, and is thoughtful of his associates.

He will always be on time, particularly for the first case in the morning. Sometimes, there are unavoidable incidents which may make succeeding cases late, but if he is on time for the first one, he does not engender into his associates an irresponsible attitude. Punctuality, also, decreases loss of time, and very often, lessens the risk to the patient.

If the surgeon is a good executive, he will realize that everyone on the team, as well as himself, is under a certain amount of pressure and tension. When he does, he will be calm and his attitude will reflect this calmness and he will stimulate more team co-operation. Professional poise is an asset to both surgeon and nurse, alike.

The boss attitude, on the other hand, prompts him to act this way; Hold the retractor *this* way! Fix my sutures *that* way! or Get me the lap pad! Does this favor team co-operation? It does not and this cannot be leadership.

I have seen men in the O.R. over a period of years, with fine education and high skill, develop men under their tutelage and bring out all their natural aptitudes to the point where the pupil replaces the master in surgical deftness. What was the attitude of this surgeon which made possible the subjugation of his own ego, permitting the pupil to excel him? I think it was a full recognition of his Hippocratic Oath, dedicating himself to heal the sick. It was, also, a willing transference of his skill to his pupil, realizing that some day, he would pass away and that human illnesses would continue; therefore, he felt obligated to leave a successor at least his equal, and preferably, superior to himself.

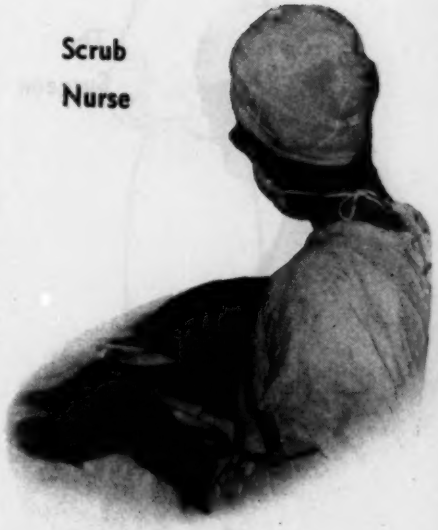
Contrast this with a surgeon of equal skill whose attitude, motivated by his egotistical self-seeking for recognition, will not permit any infringement on his high estate. Isn't he forgetting his Hippocratic Oath? This, definitely, was the basic difference between these two men; their attitude and viewpoint. These are the basic principals of successful team play.

Now, the O.R. Supervisor! In my opinion, she should rightfully schedule all operations or have a firm voice in their scheduling. She would not permit personal likes and dislikes to influence preferential scheduling. If you happen to be the nurse taking a booking, I am sure none of you have ever permitted personal feelings to influence you. You could not if you had the right concept of your position. You must realize that the operation is being scheduled for the patient's benefit; not the surgeon's!

The supervisor must work hand in hand with the admitting clerk in limiting admissions to the number of cases that can be accommodated in the O.R. in one day.

The supervisor is solely responsible for sterility of supplies and equipment in the O.R. She will permit no compromise of sterility.

She encourages punctuality in her nurses as well as the surgeons to in-



Scrub Nurse

The Surgeon

sure a smooth-running department and perfect team play among its members.

You have often seen a member of an operating team, because of not being sure of himself, become rude to either the nurse or assistant. This is where a good head nurse senses a bad situation and with just a few words of admonition to the impatient surgeon and a few words of encouragement to the confused nurse, smooths out a difficult situation.

The O.R. supervisor is truly the vital cog in sparking team play. Her attitude, as well as training and experience, can do much in the way of getting the co-operation of the surgeon, anesthetist, and all members of the O.R. team. She leads her team because she has training, experience, and the proper attitude.

When I first started to do surgery, I quite frequently would see a nurse who would become unsterile, to her mind, and she would look around to see if anyone had noticed. If no one had, she would immediately consider herself still sterile. You cannot, in the O.R., be "a little bit sterile" or "a little bit unsterile" any more than a woman can be "a little bit pregnant".

There is little substitute for competence to the extent that we know our jobs and with that feeling of security and knowledge, we are possessed of poise and confidence. This is true of both nurse and surgeon.

On the other hand, insecurity produces an opposite effect. When we do not know or are not sure, we become nervous, jumpy, and emotionally unstable. You rarely see a well-trained surgeon or nurse lose control when facing difficulty.

On every team, each member has his role to play; each member must do his work thoroughly so that there is only one attitude among the members; this attitude is one of team play. Then, and only then, do we have a smoothly-functioning group. Each person must remember that a momentary loss of team play may mean, also, the loss of the patient's life.

Let's consider the nursing profession; your profession. You may all be extremely proud of the dignity your profession has attained since the pioneer days of Florence Nightingale. Reflect, if you will, for a moment, what made Florence Nightingale what she was and what she stood for. It is really comparable to the contents of our Hippocratic Oath. It is the dedication of self

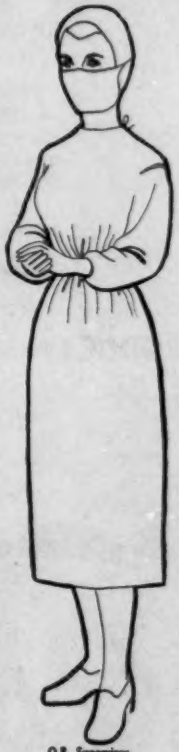
to suffering humanity. Didn't she by her inspiration and leadership, transmit that attitude to others? Wasn't it the acceptance of these attitudes by others, including yourselves, that molded you into the group of professional leaders that you are today?

It wasn't too many years ago when the R.N. in addition to all her professional duties and skills, had to perform many menial and distasteful tasks such as scrubbing floors and walls. Many years ago, at least twenty, I, myself, talked to heads of training schools and suggested, then, that they should have a minimum of two classes of nurses; one with the higher degree of training and skill to take care of the sick patients and one with lesser training, to give baths, make beds, and carry trays and bedpans.

The nursing profession has finally reached maturity. The attitude of surgeons and physicians has accepted your arrival. The change in attitude is, today, more marked than ever. Many of you have had experience with physicians and surgeons whereby their attitude showed they did not accept you on an equal professional level. You have also seen many of these same men today consider you in an entirely different light, with new-found respect and admiration.

My personal opinion is that, today, the professional attitude is not being accentuated sufficiently in training schools. Some of the newer nurses coming out today feel they should only supervise and not be required to do any bedside nursing. I believe this is wrong. Your profession will become the same as ours; top-heavy with specialists and very few general practitioners.

I have practiced surgery for many years and I have noted many changes in surgical procedures and technics, in medications, and in hospital facilities. Sad to say, I have also noticed a lacking in both nurses and doctors in regard to their professional attitudes. The advent of antibiotics have made a marked contribution to the surgeon and to the patient's welfare. They have, also, tempted our professions; both yours and mine, to become slip-shod in our technics and attitudes, as well. This is definitely a wrong attitude for all of us. We should maintain the same high aseptic technics just as though these Heaven-sent



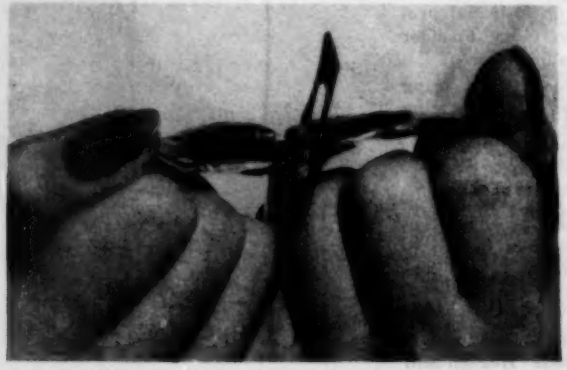
O.R. Supervisor

drugs were not available. As I said before, The Patient, in the final analysis, is the only reason for our existence.

Frequently personalities will clash. To avoid this, the owners of these personality bombshells should not work together. Separately, they may radiate good team spirit and be dynamos of accomplishment but together, they destroy the morale of the team, hinder its operation, and in the end, endanger the life of the patient.

To the extent that we accept the concept of team play, many of our personality problems will be conquered and vanish. I feel that striving for the objective of team play, we can all lead richer lives and happier lives in the professions we have chosen, dedicated to the relief of human suffering.

NEW PRODUCT



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Preoperative and Postoperative Care in Transthoracic Surgery *

George A. Olander, M.D., Assistant Chief, Surgical Service, VA Hospital, Hines, Ill.
and Max S. Sadove, M.D., Assistant Professor of Anesthesia, University of Illinois College of Medicine, Chicago

SURGICAL procedures of the esophagus and adjacent areas of the stomach today are frequently successful, whereas only a few decades ago they were considered beyond the realm of surgery. Good care for this group of patients depends upon speed in execution of a well-organized plan of action.

It is of great importance that the patient be studied carefully from a dietary standpoint. Some can only drink fluids. Attempts are made to vary the diet so that the greatest nutritrional value is obtained and to keep the food from becoming monotonous.

Our aim is to accomplish the intake of a minimum of 3000 calories containing 1.5 gm. of protein per kilogram of body weight per day. A gain in weight is strived for and is indicative of a positive nutritional balance, provided the patient does not have edema. When oral feedings are inadequate, the intravenous route is utilized to supplement the caloric intake with glucose. Rarely have we utilized a jejunostomy preoperatively, because we do not feel that it is a satisfactory means of acquiring a positive nutritional balance. When this is necessary, a jejunostomy is preferred to a gastrostomy because the stomach is then left free for further surgical procedures. The jejunostomy may be retained for future feedings.

The patient is encouraged to keep his muscular activities at an optimum level. He is instructed how to cough, perform upper and lower extremity exercises, and

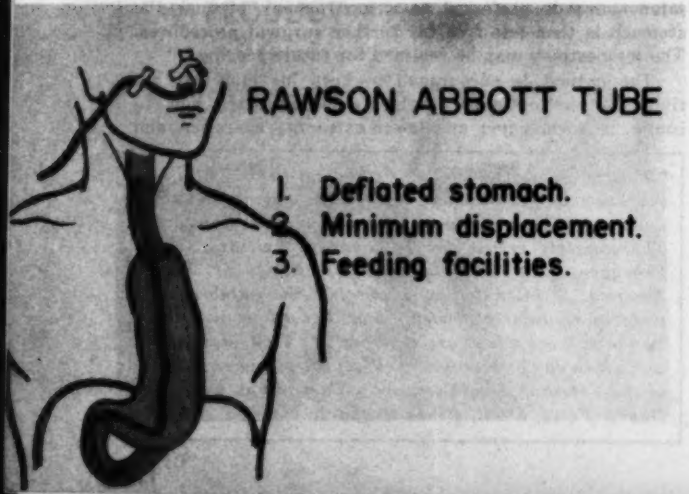
** This is an abstract of an article entitled, "The Preoperative and Postoperative Management of Patients undergoing Transthoracic Gastroesophageal Surgery". The complete article can be found in Vol. 31, No. 1, February, 1951 issue of Surgical Clinics of North America. Printed by permission of the authors this material contains statements and conclusions published by the authors which are the result of their own study and which do not necessarily reflect the opinion or policy of the Veterans Administration. Illustrations, courtesy, Daurie Petze, artist, Hines Hospital.*

how to breathe deeply. He is encouraged to walk about the ward, and a cheerful frame of mind is maintained with the aid of suitable recreational facilities.

When possible, foci of infection should be irradicated, but in urgent surgical conditions one should not delay. Patients with inflammatory lesions of the tracheobronchial tree are placed on aerosol penicillin preoperatively. Other forms of antibiotics are used as indicated.

GASTROESOPHAGEAL PREPARATIONS

The esophageal contents of patients that have dilatation and retention are aspirated by continuous suction at night. This is accomplished by placing a Levin tube in the esophagus and allowing the patient to swallow water, thus mechanically washing out the esophageal contents. A solution of aureomycin is given to obviate the possibility of contaminating the surgical wound with infected esophageal contents.



The anesthetist should see the patient several days before the contemplated time of surgery and, in conjunction with the surgeon, should discuss the special problems such as position of the patient, approach to the operation, incision, and surgical technic.

Morphine is kept at an absolute minimum in the older age groups, in which dosages of 1.4 to 5 mg. (1/48 to 1/12 grain) are used. Our fear of morphine is based on its depressant effect on the vaso-accommodative processes. The barbiturates are used for their sedative and hypnotic effects, but always their dosages are kept at a minimum for fear of over depression. Drugs should be given intravenously or intramuscularly so that adequate absorption is assured. The belladonna alkaloids are used for their depressant effect on the parasympathetic system and to combat the undesirable effects of morphine. The night before surgery, the patient is given a short-acting barbiturate to insure sleep. He is shaved, and a cleansing enema is given.

RAWSON-ABBOTT TUBE INSERTED

A Rawson-Abbott tube is inserted and tied in place by reversing a scrub mask on the patient's face. By tying the tube in place, extraction during motion is prevented,

yet the tube is readily accessible during surgery. This also eliminates the possibility of pulling adhesive tape into the nasopharynx.

Chest x-rays, blood count, hematocrit and total protein are repeated the day before surgery. The patient is also placed on penicillin and streptomycin twenty-four hours before surgery unless a focus of infection is already being treated by antibiotics.

Immediate Care of the Patient in the Operating Room—During the process of moving and transporting the patient, the observations and records made by the anesthetist during the operation are continued so that serious complications may be prevented, especially shock, atelectasis, hemorrhage and pneumothorax.

A small compact dressing is placed upon the incision and around the drainage tube, allowing a maximum area for physical examination of the chest. The patient is slowly (five to ten minutes) turned on his back. Turning is not started unless we are sure that the patient will tolerate this maneuver, since this may produce shock.

It is mandatory that the intravenous system remain unchanged so that fluids and blood can be administered without delay should there be need of additional fluids due to shock. Secretions which have accumulated within the tracheobronchial tree should be removed before the patient is transferred from the operating room.

A No. 16F catheter is inserted through the endotracheal tube into each of the main stem bronchi as far distally as possible. It is important that the patient be in a light plane of anesthesia and preferably almost awake, for in reality it is the intense coughing produced by the

ABSENCE OF TUBE

Produces:

1. **Distension of stomach.**
2. **Displacement of lung.**
3. **Tension on suture line.**

SUCTION

catheter that cleanses the tracheobronchial tree by forcing the secretions into the main stem bronchi, where they may be aspirated by the catheter.

WATERSEAL IS IMPORTANT

The waterseal is of tremendous importance. We prefer two tubes of 3/8 inch internal diameter, one placed

anteriorly in the fourth interspace in the midclavicular line and one posteriorly in the fourth interspace in the midclavicular line and one posteriorly at a convenient location, usually the ninth interspace in the midaxillary line. The waterseal bottles are made to function properly during the closure of the chest. Before the patient is removed from the operating table, the waterseal bottles are checked to be sure that there is a negative pressure, that they are fluctuating, and that there is adequate drainage of the accumulated fluids. If these conditions do not exist, the tubes should be inspected for kinking and irrigated with a sterile bacteriostatic solution to insure their potency. During this period of transfer it is important to prevent the water in the bottle from being siphoned into the chest. This is done by doubly clamping the tubes before they are elevated above the level of the patient.

The following mechanical features are important in the construction of a waterseal: (a) the fluctuation of the water should be readily visible; (b) the bottle should not be easy to break; (c) the connection should be secure, unbreakable, and with an adequate lumen; (d) the tubing should be noncollapsible heavy gum rubber; (e) the underwater glass tube should be adjustable so that it does not extend more than 1 inch below the water level.

Care of the Patient in the Recovery Ward—All patients sent from the operating room to the recovery room remain there until, by mutual consent of the surgeon and the anesthetist, it is felt that the patient may be safely transported to and cared for in the surgical ward. When the

patient's condition is satisfactory, he is transported directly from the operating table to the surgical bed.

MEDICATIONS FOR RECOVERY ROOM

In the recovery room the following medications and accessories, particularly important to the care of the transthoracic patients, are available at the patient's bedside for immediate use: a suction machine with a catheter attached for tracheobronchial aspirations through the endotracheal tube; oxygen; a Wangensteen suction apparatus and syringe for irrigating the Rawson-Abbott tube for immediate decompression and aspiration of the gastrointestinal tract are at hand; intravenous fluids; blood typed for the patient; and vasopressor drugs.

Routine Postoperative Care—Ordinarily, in the first postoperative days, we order fluid, 1 liter at a time, to be given slowly (four to six hours) to prevent pulmonary edema and not overload the right side of the heart. Fluids are given in the greater saphenous vein if possible, and periods of mobilization are allowed.

To the 5 percent glucose and water, 500 mg. of vitamin C, vitamin B complex, and 5 mg. of vitamin K are added. In those patients in whom the Rawson-Abbott tube is successfully working by decompressing the stomach and allowing feedings into the duodenum, intestinal feedings are started usually after the first twenty-four hours. When an anastomosis has been accomplished, we continue this feeding for six or seven days. Ordinarily the patient is started on some simple feeding such as glucose and water

containing soluble vitamins. If this feeding is tolerated, the intestinal feedings are increased by adding skim milk, milk proteins and fat until we are able to give the patient about 2500 calories containing 1.5 gm. of protein per kilogram of body weight supplemented with vitamins A, B, C, D, and K.

DRAINAGE TUBES PLACED IN CHEST

Closed drainage tubes are placed in the chest to overcome pneumothorax and to drain the accumulated serum and blood. These tubes are checked repeatedly. The posterior tube is removed (usually in three or four days) when there is no further evidence of accumulation of serum and blood.

Gastrointestinal Suction is employed for dilation of the stomach.

Bronchial secretions must be removed from the tracheobronchial tree without delay. The patient is urged to breathe deeply on the average of ten times every half hour. If secretions are present, he is urged to cough. If coughing is inhibited because of chest pain, an intercostal or paravertebral block is accomplished to relieve this pain. If this fails, the secretions are aspirated by means of a nasal catheter.

INTERCOSTAL NERVES INJECTED

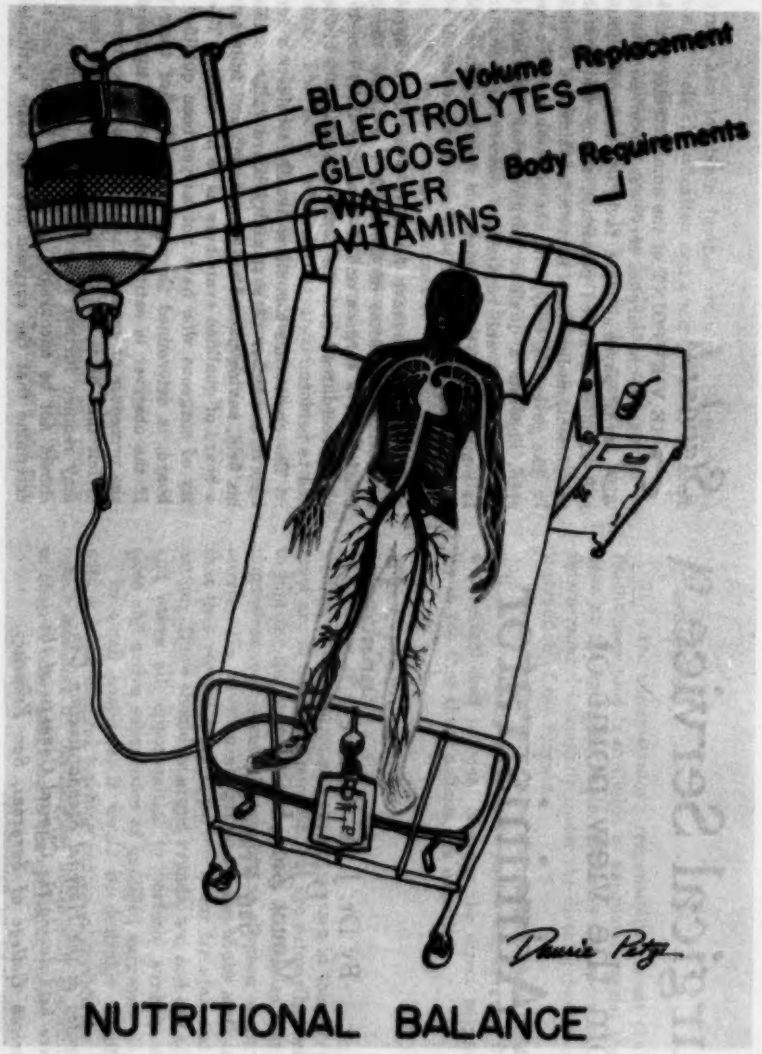
Injection of the intercostal nerves with nupercaine in oil during the operation gives a lasting analgesic. The patient may have analgesia from the 0.5 percent procaine which was administered intravenously during the operation, but if he still complains of chest pain, paravertebral and intercostal blocks are done without hesitation.

Hemoglobin and hematocrit are immediately checked postoperatively and repeated every day. Blood replacement is given accordingly.

Penicillin and streptomycin, 300,000 units of penicillin per day and a gram of streptomycin per day are given. If an infection develops, culture and sensitivity of the organism to antibiotics are obtained so that the proper antibiotics may then be given.

PATIENT BECOMES AMBULANT

The patient becomes ambulant as soon as his condition permits. Beginning with the time when the patient arrives in the recovery ward, his position is changed frequently. He is encouraged to flex and extend his legs, is propped up in bed and progresses to ambulation by sitting at the side of the bed, swinging his feet, sitting in a chair, and finally walking.



NUTRITIONAL BALANCE

Surgical Service

from the view point of

the Administrator

By Dr. J. A. Katzive
Director
Mount Zion Hospital
San Francisco

Presented at the Hospital Standardization Conference held during the Clinical Congress of the American College of Surgeons, San Francisco.

Standards

THE VIEWPOINT of the administrator with reference to the surgical service is concerned with standards, physical plant facilities, surgical equipment and supplies, qualified personnel, safety and welfare of the patient, medical-legal aspects, teaching and economy.

The governing body, with the assistance of the medical staff, appoints a qualified surgical staff and lays down general policies and regulations concerning standards to be maintained. The administrator sees that these policies are followed; the medical staff sees to their actual execution.

Some hospitals have found it desirable to appoint a credentials committee of the staff to evaluate the qualifications of a surgeon and if necessary limit him to surgical procedures which the committee considers him qualified to perform.

The credentials committee usually considers a surgeon who is a member of a specialty board fully qualified in his field, having passed an examination and fully satisfied a board of qualified examiners as to his ability. The ability of surgeons who have not as yet been qualified by a board, is determined through observation of their work. If the observer is satisfied, the surgeon is approved for the procedure or general classification of procedures. If it is felt that he is not qualified, the credentials committee may require further review and may determine that he should not be encouraged to qualify himself; or it may determine that the surgeon has the basic aptitudes and

encourage him to obtain further training. Surgeons are advised of their classification and are expected to schedule surgery accordingly.

The administrator keeps an individual card record of every surgeon, a duplicate is kept in the operating room supervisor's office. When an operation is scheduled the supervisor checks the surgeon's card for his classification. If he is to be observed in a procedure, the chief of staff designates a qualified observer who reports his findings to the credentials committee through the administrator. If the surgeon is not approved for the scheduled procedure he is so advised and encouraged to take the matter up with the credentials committee.

In regard to legality of this procedure, it should be pointed out that the Board of Directors has the responsibility of selecting the best qualified physicians as staff members and determines what members will or will not use its facilities. The board advises the surgeon that he may not use the hospital facilities for such procedures as he desires to perform. That does not preclude his privilege of doing this procedure in some other institution.

Physical Facilities

It is the responsibility of the administration to provide surgeons with a working plant. Such a plant will provide all structural facilities, such as ventilation, lighting, humidity and such mechanical features as pressure and suction.

Personnel

It is the administrator's responsibility to see that sufficient personnel is available to adequately assist the surgeon at the operating table. While in the operating room this personnel is actually under the direct supervision and instruction of the surgeon.

The operating room supervisor and all those under her will do everything possible to assist the surgeon in line with established policies. She has the direct responsibility to see that these policies are executed.

Teaching

Residents, interns, and student nurses in the operating room are to assist the surgeon, but are primarily assigned to him for the purpose of acquiring training so that they themselves may eventually qualify as surgeon or surgical nurses. We have an obligation to the house staff to see that they receive every opportunity for training and education. There should be grand rounds, wet and dry clinics, and above all, opportunities to perform surgery under close and active supervision of qualified surgeons.

In small hospitals, it would be desirable to affiliate with a large medical teaching center to provide the more senior members of the surgical house staff opportunities to observe other surgeons in the operating room.

(Continued on next page)

Safety and Welfare

The administrator is concerned with the safety and welfare of the patient. In addition to safeguarding the patient against mechanical failure, explosion hazards, he must exercise every care and caution in the selection of all personnel in the operating room. To protect the surgeon and hospital, he must ascertain that adequate consent forms are provided and completed by the patient. He must make certain that proper records are kept. Surgeons are required by regulation of the medical staff to show a preoperative diagnosis before the patient comes to the operating room; and a postoperative diagnosis is recorded, based on the report of operation dictated after surgery.

All tissues removed by the operation must be sent to the pathologist for examination. He has a moral and ethical obligation to report any persistent discrepancy between the pre-operative and post-operative diagnoses and the pathological diagnosis of the tissue examined. In this connection, the medical auditor will make invaluable contributions to the effort of maintaining high standards.

Economy

Hospitals today are more than ever conscious of the need for economy in the operating room. There are opportunities for saving if an effort is made. Some surgeons are found to be more economical than others in the use of surgical supplies, such as expensive suture material and in handling costly and delicate instruments. In the last analysis, waste in the operating room reflects on the patient, because costs are eventually borne by him.

Some of us become too preoccupied with administrative detail better delegated to assistants and department heads, as a result of which we often do not have sufficient time for high-level thinking, planning and attention to maintenance of standards. Because we appear to be concerned primarily with maintenance, housekeeping, and accounting problems, the impression is created among some of the medical staff men that that is the sole responsibility of the administrator, so that when he does concern himself with hospital and medical standards, questions arise in the minds of the staff as to whether or not he is stepping out of his province.

Education

There is a need occasionally to educate the medical staff to the realization that administrators have the duty to see that the highest medical and surgical standards are maintained in the hospital, so that when they do make recommendations to that end, suggestions will be well received. With such an understanding, there should be little opportunity for personal issues to arise between the staff, administrator, and the operating room supervisor.

It is through such coordinated efforts of the surgeon, the operating room personnel, and the administration that such great strides have been made in the advancement of the surgical service in the hospital.

Question Box

Each month questions pertaining to O.R. problems and technics will be answered by Dr. Carl W. Walter, nationally known for his operating room technic courses and as the author of "Aseptic Treatment of Wounds" (MacMillan). Questions should be addressed care of the O.R. Editor, Hospital Topics.

Q. Do you feel any special precautions should be taken and carried out filling the so-called dirty operation.

(a) Do you feel the O.R. should be closed for a period of 24 hours?

(b) Any special washing or sterilization of instruments?

(c) Any special cleaning of furniture and walls of O.R.?

Outline ideal preparation of skin prior to surgical incision.

(a) Agent

(b) Time element

(c) Type of mechanical application.

A. May I suggest that you refer to Chapter 15 of "Aseptic Treatment of Wounds" for a much more detailed explanation of the technic for handling linen and instruments from a "dirty" case than is possible here.

Q. What do you feel should be the definition of a so-called "dirty" or septic case?

A. "Dirty" or "septic cases" should include every case where pus or gangrene is encountered, compounded injuries or operations upon the intestinal tract or perineum.

Q. What procedure in sterilization would you recommend after using syringes and needles on a patient with infectious hepatitis and what procedure should be carried out if the patient should need surgery?

A. All syringes and needles whether meant for use on a patient with viral hepatitis or for routine use, or coming from any patient should be sterilized in a steam sterilizer at 250° F. for 30 minutes. The instruments and linen from a case involving a patient with hepatitis should be treated as described in Chapter 15 of "Aseptic Treatment of Wounds". Briefly, the instruments are sterilized in steam after use and the linen is handled as precaution linen. Instruments and other articles which do not withstand steam sterilization are immersed in germicide for the required length of time.

(Continued on next page)

Q. Can one safely and completely sterilize a large piece of folded plastic sheeting in a sterile surgery pack without exposing all surfaces to direct steam?

A. Plastic sheeting can be sterilized in a steam sterilizer at 120 degrees centigrade if it is interleafed with a muslin sheet and rolled into a cylinder so that steam penetrates easily. Folded plastic sheeting is difficult to sterilize in a hospital sterilizer because the steam penetrates the folds very slowly and inaffectively.

Q. Possibly you are familiar with the "Singer Sewing Machine". It was being used quite often in clean cases over a period of a year and we had six infections.

The silk is wound on steel bobbins quite tightly in order for the machine to work smoothly. We believe that the silk must be wound too tightly to permit proper sterilization by steam.

Is there any method by which these bobbins can be sterilized by steam without too much trouble?

A. The Singer Stitcher should not be difficult to sterilize if properly cleaned. The silk should not be wound on the bobbins too tightly because it becomes weakened as it shrinks during sterilization. I suggest that you wind it on the bobbins and moisten it with several drops of water just before it is put in the sterilizer. Thirty minutes at 250° F. should sterilize it reliably. The Stitcher should be loosened at any joints before put in the sterilizer.

Q. Since I attended your Institute in Ann Arbor, I know you would be glad to tell me the correct method in preparing sterile cocaine solution for eye surgery. If using chlorobutanel, how long must the solution stand before considering it sterile? How much chlorobutanel should be used?

A. Cocaine solution can be made up exactly as the morphine solution described on page 300-301 of "Aseptic Treatment of Wounds." It can be stored indefinitely and when sterilized in saturated steam at 250° F. for 30 minutes, you need not add chlorobutanel.

Q. In the June 1951 issue, page 53 question and answers, I am referring to the need for suture ampoule jars and covers being heat sterilized. This seems to differ with the statement made in the "Aseptic Treatment of Wounds" Book on page 36 under Surgical Gut. I am confused and would like to know which method is correct.

A. In answer to your question regarding a pre-sterilized jar for sutures, if you use a jar with a tightly fitting lid or cover, you must sterilize the jar before filling with sutures or ampoules because the fumes of the formaldehyde disinfectant cannot penetrate between the two tightly opposed surfaces. If you use a jar with a loose cover, such as is described on page 36 of "Aseptic Treatment of Wounds", you may take a clean, unsterile jar and cover; fill the jar with ampoules or sutures; add the formaldehyde germicide and quarantine for 18 hours and then use. The fumes of the germicide will disinfect the rim of the jar and the inside surface of the cover.

Q. Can saline solution be used in a transurethral prostatectomy?

A. Saline should not be used in a transurethral prostatectomy because it is a good electrolyte which interferes with the action of the cutting currents and liberates hydrogen and oxygen by electrolysis which in itself is a hazard. You can prevent hemolysis of blood during a transurethral by using a solution of glycol for irrigating.

Q. Why is acetic acid used on glassware?

A. It is used to remove alkali earth film from glassware but it is an expensive way of doing something which can be avoided by using a non-ionizing detergent for cleaning the glassware initially.

Q. How do you disinfect intubation tubes in a tuberculosis case?

A. They should be scrubbed inside and out with a solution of calcium hypochlorite (chlorinated lime) made with 4 teaspoonfuls of chlorinated lime to a gallon of water.

Q. Do you recommend using an operating room indiscriminately for clean and dirty cases?

A. Yes. There is no need for quarantining a room which had had a "dirty case." With a suitable technic for disposing of contaminated linen and instruments, that room can be used again just as soon as it is emptied.

Q. Does calcium hypochlorite have any effect on rubber?

A. Not if the articles to be disinfected are not left soaking. Drop the tubing, etc. in; flush through with the solution; rinse with tap water and dry.

Q. What germicide should be used for disinfecting dry instruments?

A. No germicide will act quickly enough to be practical.

Q. Is it necessary to cover instruments being carried from the sterilizer to an operating room?

A. No, not if the floors are kept clean; the nurse is wearing a mask and nobody talks over the instruments. The air itself will not contaminate the instruments.

Q. Are muslin boots satisfactory for use in the operating room?

A. No, muslin boots should not be worn in the operating room because they insulate the wearer from the floor. Shoes with conductive rubber soles should be standard footwear for the operating room personnel.

Q. Do you recommend disinfecting ampoules in 70 percent alcohol?

A. No. The alcohol does not destroy spores. The alcohol should be fortified for this purpose with formalin. A good formula is:

isopropyl alcohol 99%	700 cc.
formalin USP 37%	25 cc.
sodium nitrite	1.0 gm.
sodium bicarbonate	1.0 gm.
distilled water qs. ad.	1000.0 cc.

Q. Can ether be used for disinfecting the skin?

A. Ether should not be used for this purpose. It is wasteful and its vapor is an explosion hazard. The amount spilled during disinfection of the skin is enough to

blow an operating room apart. It is not a good fat solvent; has no germicidal properties and is a poor detergent.

Q. We now use a three-burner open-flame gas stove in our workroom for heating solutions and boiling special equipment in distilled water—i.e., syringes for eye irrigations. The suggested change was to have the gas stove removed and to purchase an electric heating cabinet to heat solutions. However this would create somewhat of a problem. We have only one small autoclave and two non-pressure boiling-water instrument sterilizers to sterilize all of the operating room supplies. Although these sterilizers are thoroughly cleaned once a week with Stero Klean solution, we still have too much sediment to safely use them for eye syringes, etc. Do you know of any type of small electric stove or burner which would comply with the National Fire Protective Association regulations?

A. It is not safe to have an open flame in an operating room for any purpose. I suggest that you sterilize your syringes for eye irrigations in a steam sterilizer. When suitably packaged, they can be done at odd times and need not interfere with your autoclaving schedule.

Q. Do you feel one loose fly in the Operating Room is a serious threat to the maintenance of sterility?

A. Certainly one loose fly is as much of a hazard in an operating room as a horde of flies. Operating rooms should be sprayed with an aerosol-insecticide once daily in the season when flies and insects are a problem.

Q. Do you feel the 48 hour preparation of the skin (commonly used by Orthopedic Surgeons) has merit and should be used?

A. The ideal skin preparation for a patient being prepared for elective surgery, either general or orthopedic, is for that patient to scrub the operative site for 5 days before operation, once daily with any of the soaps or synthetic detergents containing hexachlorophene (G-11). This will give the patient maximum suppression of bacteria and skin that is ready for operating. At operation, a lather should be worked up with any of the hexachlorophene-containing agents. The lather should be shaved off with a sharp straight razor by a person skilled in the use of a straight razor. The skin is then prepared in one of two ways:

1. It may be scrubed with 1-1000 aqueous Zephiran with 40% isopropyl alcohol.
2. Aqueous iodine 2% may be flooded on to the area and let stand for a minute. Excessive iodine is then removed with 40% isopropyl alcohol.

I do not feel that the prolonged orthopedic skin preparation is of any value. It usually macerates the patient's skin and needlessly increases his apprehension.

Q. How would you advise sterilization of lamp carriers connected to bronchoscopes used in tuberculous patients?

A. Lamp carriers in bronchoscopes used in patients with tuberculosis can be disinfected by wiping clean with a solution of calcium hypochlorite made by dissolving one teaspoonful of household chlorinated lime to a gallon of water.

Q. I would like your opinion on the use of diack controls. Is it necessary to place a diack control in each package, regardless of how small it may be?

A. I do not feel there is any justification for the use of "telltale controls." Sterile dry goods result only when the proper combination of packaging of supplies, loading of the sterilizer, and operation of the sterilizer is used. Carelessness in any one of these factors will result in unsterile dry goods. You will find this subject discussed in detail in Chapter 10 of "Aseptic Treatment of Wounds."

Q. How should vaseline gauze be sterilized?

A. Small quantities of vaseline gauze can be sterilized in dry heat at 250° F. for six hours, making sure 0.5 percent water is added to the gauze before it is put into the sterilizer. Large sheets of vaseline gauze are sterilized in saturated steam at 250° F. for 30 minutes and then left in dry heat at 250° F. for an additional six hours. Again, be sure to hydrate the gauze before placing it in the sterilizer.

Q. We would like to use zephiran chloride as an antiseptic and bactericide throughout our hospital, to eliminate confusion caused by the use of a number of agents. We would appreciate any information or reprints that you could send us validating the use of zephiran chloride as a bactericide.

A. I do not believe that you need to worry about the germicidal efficiency of zephiran chloride. It is a reliable germicide *IF* it is used properly. By this I mean that the proper concentration of germicide must be maintained on the object which you wish to disinfect. Dirt, grease, textiles, etc., all become coated with the quaternary ammonium compounds, and hence the solution in which these objects are stored becomes less concentrated and less efficient as a germicide. There is little reason for changing the recommendations on pages 28 and 29 of "Aseptic Treatment of Wounds." An exception would be the use of the new compound Zephicide for disinfection of cutting edge instruments. Here the period for destruction of vegetative organisms is 30 minutes; spores, 18 hours.

Q. *In a small hospital where some supplies are not used very often, such as tracheotomy tray, is it still safe to go without re-autoclaving indefinitely? Is material wrapped in two thicknesses of heavy grade muslin sufficient to insure sterility indefinitely? (No pins used, we tie all wrappers.) What do you recommend for abdominal prep, vaginal prep, and rectal prep in the operating room?*

A. Supplies which are properly packaged and wrapped in four thicknesses of muslin can be stored indefinitely in a clean, dry, vermin-free place. Sterile wrappers should be made of double thickness muslin and the package wrapped so that every surface is covered with four thicknesses. You will find this technic minutely described in Chapter 10 of "Aseptic Treatment of Wounds."

Ideally, a patient being admitted for elective surgery should be instructed to wash the operative site daily for five days with any of the synthetic detergents or soaps containing hexachlorophene (G-11). At operation, a lather is worked up with one of these agents and the hair and desquamating epithelium shaved off with a straight razor. The skin is then scrubbed with alternate sponges moistened

in 40 percent isopropyl alcohol and 1-1000 aqueous Zephiran. You will find this technic described and illustrated in Chapter 12 of the before mentioned book.

Q. During one of our lectures you recommended the window type of air conditioner for operating rooms. When I requested this type of equipment for our operating rooms, and when our engineer attempted to obtain quotations, we were informed that window air conditioning equipment is hazardous in operating rooms for two reasons: (1) there would be danger of electric spark; danger of static electricity, and no control of humidity and (2) there would be danger of infection because the air would be recirculated. The only type of equipment available is an expensive installation requiring ducts and drawing out of air, etc. The cost would be $30,000. Do you know of any hospital where the window air conditioning equipment has been installed? Have new regulations been made since the time you advised us to install the window type?

A. You will find that the National Fire Protection Association Bulletin No. 56, for 1952, permits the use of a unit type of air conditioner in operating rooms, provided they are properly installed. Almost any first-grade domestic type conditioner is safe if installed five feet above the floor. There is no need for control of humidity in this regard and the danger of infection due to recirculation of air is not a consideration of major import in a clean operating room.

NEW PRODUCT

Unrestricted surgical approach for brain and upper spinal operation is possible with the neurosurgery headrest, S-1580-X. Headrest fits securely into the crutch and sliding sockets along the siderails of any operating table of normal width. Sponge rubber pads are so placed as to assure full immobility; yet each may be adjusted quickly to allow access to any part of the head. It is also possible to remove one or more of the pads as desired. The illustration shows one head brace removed to give side access for parietal surgery. The upright position of the patient and the spacing of the braces allow ready administration of anesthesia. Shampaine Co.

Are YOU Careful About Reading the

LABELS

This editorial, reprinted from the J.A.M.A. is of interest to all concerned with the care of patients. Its subject matter is of particular interest to those working in an operating room where so many of the drugs administered are given in times of emergency when confusion, fatigue and haste make the problem of proper identification of drugs more acute.

FROM time to time accidents are reported because of failure to read labels of potent drugs before these drugs are injected. While it is true that a physician is generally advised against the use of a drug unless he is familiar with its action, the fact remains that many potent remedies which are familiar to him are made available in a variety of dosage forms and doses which are not always readily apparent unless the label is examined carefully. Attempts have been made from time to time by, for example, the use of colored labels and cautionary statements to warn the user at a glance of the nature of the product he is using. Various suggestions have been made by physicians, pharmacists, drug manufacturers, law enforcement officers, hospital officials and others, but so far a completely satisfactory solution has not been offered. It is still necessary for the physician or whoever uses or prepares a drug to carefully read a label to learn what he is using. Some have proposed the use of different colors,

for example, red for intravenous use only, white for subcutaneous and intramuscular use and blue for intravenous, subcutaneous or intramuscular use. Others have suggested tinting the solutions. Of course, the use of colors is limited by memory and by the number of colors available. It probably never would be possible to get sufficient distinctive colors to differentiate all solutions, let alone the variety of strengths of each drug. As has been pointed out by some, the coloring of liquids probably would only encourage laziness, indifference or a false sense of security. Others have proposed the use of diagonal lines.

Need for Informative Names

Many educators, practicing physicians and organized groups, such as the Council on Pharmacy and Chemistry, have attempted to draw attention to the hazards associated with the use of dangerous drugs, to the need for using informative names and for providing, if possible, adequate cautionary statements on labels. However, the consensus probably can be summarized thus: There is no easy shortcut. Nothing can take the place of constant vigilance and careful reading of labels. It cannot be too strongly impressed on all who handle drugs that any drug can be dangerous if incorrectly used and that reliance cannot necessarily be placed on someone else to do the reading and provide adequate safeguards. One can avoid errors only by acquiring a habit of deliberately checking the label of any drug used rather than relying on its appearance or on the verbal statement of an associate. The manufacturer or whoever prepares drugs should label them properly, and the person administering the drug should read the label. If a solution or other dosage form looks questionable it should be discarded, or if a label becomes detached and one cannot be sure of the nature of a drug it should not be used. The use of colors alone would not solve the problem, as there are comparatively few persons who have a sufficiently good color perception and memory for shades to allow them to safely differentiate between say twenty or thirty colors.

Attempt to Create Significant Labels

Many drug manufacturers have given careful consideration to the creation of labels which would be as significant as one could make them, but these efforts depend in the final analysis on the physician's reading the label before he uses a drug. While the fear of litigation and the possibility of heavy damages may have in some instances a sobering effect on the attentiveness of a physician, part of the remedy lies in impressing on medical students, interns and residents the dangers associated with the misuse of drugs, developing a heightened awareness of the possibility of danger in the mind of the practitioner and the encouragement of habits in the hospital and in private practice which tend to keep to a minimum possibilities of confusion. The misuse of a drug may mean loss of a life. It is the responsibility of the medical profession to save lives if possible, and anything that it can do to prevent an accidental loss of life supports its primary objective.

Conserving Supplies in the Operating Room

By Sarah Collins, VA Hospital, McKinney, Texas

The concern over rising costs of equipment and labor that has been plaguing the hospital administrator is felt in the departments also. These suggestions for the conservation of supplies may be helpful in controlling waste in your department.

I. Supervisor outline own program first:
   1. Analyze situation in unit to determine minimum and maximum needs
   2. Set up a standard based on needs
   3. Have a minimum emergency supply available
   4. Appoint one person responsible for issuing supplies needed as used, perhaps on a list attached to door of supply closet
   5. Have a stated time for inventory
   6. Have regular meetings and conferences
   7. Plan so as to eliminate problems before they arise
   8. Conserve time by having personnel familiar with their work

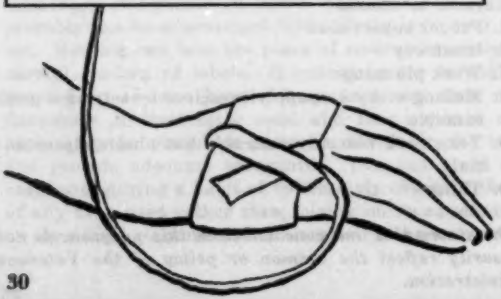
II. In conferences and meetings:
   1. Make everyone conscious of program. The value of conservation must be clear in everyone's mind
   2. Designate responsibilities to different persons
   3. Stress the importance of *thinking* before *acting*
   4. Impress the old adage "haste makes waste"—always good
   5. Give demonstration or procedures on cleaning and care of equipment and supplies. Learn the operating mechanism of equipment
   6. List initial prices of equipment and materials as well as informing personnel on the cost of repairs
   7. State advantages from proper application, as for example,—battery box should be turned off before connecting light cords to carriers. This latter burns out the bulbs
   8. Give concrete examples of what to do
   9. Reclaim useable supplies, thus cutting down on budget and type of work

III. Some definite points to be emphasized:
   1. All lights off when not in use
   2. Steam off when no heat or sterilizing is actually required
   3. Use scratch pads instead of form paper for notes
   4. Keep fewer sterile supplies on hand thus eliminating out-dated re-sterilization
   5. Have water faucet connections in good repair
   6. Observe strict sterilization of goods to prevent wear of material and to cut down on time and steam
   7. Wrap supplies in a good estimate of actual use

IV. Keynote to success:
   1. Proper supervision
   2. Inventory
   3. Work planning
   4. Making everyone supply conscious by setting a good example
   5. Teamwork not only desirable but absolutely essential
   6. Think

The statements and conclusions in this program do not necessarily reflect the opinion or policy of the Veterans Administration.

Intravenous Alcohol in Surgery



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THE anesthetic effect of alcohol was well known for several centuries before the development of modern anesthesia, and it was long the practice of surgeons to get a patient as drunk as possible before operating on him; a succession of quick libations often brought the sufferer to the point where he either felt no pain or cared little if he did. Some degree of stupor was maintained following surgery to carry the patient through the worst of the postoperative period.

However, the idea that alcohol could be given intravenously to surgical patients to alleviate postoperative pain apparently was not born until 1920, when Behan,[1] while treating patients with septicemia by injecting dilute alcohol into their veins, observed that they promptly became quieter and went peacefully to sleep. This effect suggested that alcohol given intravenously might be used as a narcotic, taking the place of morphine as a routine postoperative sedative. Alcohol is a cerebral depressant which lessens the sensitivity to pain. It affects first the cerebrum, then the cord, and last of all, the respiratory centers, while morphine depresses the respiratory centers simultaneously with depression of the cerebrum and to a lesser extent the reflex excitability of the cord. Theoretically, then, alcohol should be superior to morphine as a postoperative sedative. Behan administered alcohol infusions postoperatively to 30 patients, and only occasionally found

it necessary to bolster the effect of alcohol with morphine to relieve pain. No untoward effects were observed. It also became apparent that intravenous alcohol provided an excellent source of calories and a supply of energy to severely debilitated and weakened patients as well as to those in sudden asthenic crisis and shock.

This procedure, however, did not arouse the interest it seemed to deserve, and the value of intravenous alcohol was not fully appreciated until 1939, when Mueller[3] reviewed a series of 2,000 patients who received intravenous infusions of 5 and 10 percent alcohol solutions. In 1944 Adams[3] described the use of intravenous alcohol for both anesthetic and analgesic purposes in his text on intravenous anesthesia.

CALORIC INTAKE PROVIDED

In 1945 Moore and Karp[4] published a preliminary evaluation based on an analysis of 150 cases in which 5 or 10 percent alcohol was used to provide sedation, analgesia and increased caloric intake in surgical patients. In 1950, Grabill and his associates[5] reported that 7.5 percent alcohol, 5 percent protein hydrolysate and 5 percent dextrose prepared in 1,000 cc. of water were given as an intravenous infusion to 305 surgical patients. It was demonstrated that the alcohol was a safe, potent analgesic and sedative which could be used as a substitute for opiates and other forms of analgesia in controlling postoperative pain. Their investigation indicated that the mixture contained sufficient calories to provide complete nutritional requirements for the average postoperative patient.

The alcohol furthermore reduced the need for catheterization and the incidence of headache, nausea and distention.

Karp and Sokol[6] have recently reported that during the past nine years they have administered intravenously 3,121 liters of alcohol in 5, 7.5 and 10 percent concentrations to 2,000 patients. They found that the postoperative use of the 5 percent alcohol solution produces gratifying results, and that the use of opiates or other sedatives may be eliminated entirely if the rate of administration is adjusted to the clinical response of the individual patient. Because the sedative effect of alcohol requires 30 to 60 minutes to become well established, the infusion should be started before pain becomes severe.

The rate of flow is usually adjusted to deliver the first 200 cc. of solution in 20 to 30 minutes; the rate is then reduced to 40 to 80 drops per minute, and the remaining portion of the liter of solution is injected in three to six hours. One to two liters is usually sufficient during a 24-hour period, but as much as three liters of 5 to 7.5 percent alcohol solution may be given. A comparative study of patients who received one liter of 5 percent alcohol during the first six hours postoperatively and those given one liter of 5 percent dextrose solution revealed that the patients receiving intravenous alcohol required 33 percent less sedation. Intravenous alcohol is not only a sedative and analgesic, but a safeguard against the possibility of atelectasis and other pulmonary complications. Respiratory rate and tidal exchange are either unchanged or increased.

Alcohol apparently has a beneficial effect on the motility of the gastrointestinal tract and bladder.

Nausea, vomiting, acidosis and headache do not attend

the proper intravenous administration of alcohol, although comparable oral doses do produce these symptoms. An increase in urinary output occurs which is partially due to the fluid intake and not to the diuretic effect of alcohol alone.

ALCOHOL IS OXIDIZED

In the normal person, 90-98 percent of the alcohol is completely oxidized as fuel for immediate energy; approximately 2 percent is excreted in the urine and 0.2 to 0.5 percent is eliminated by the lungs.

Intravenous alcohol has a wide margin of safety, since the toxic dose is 7.7 cc. per kilogram of body weight, while the dose required for analgesia and induction of sleep varies from 1.5 to 3 cc. per kilogram of body weight. The average adult may be given about 15 cc. of 95 percent alcohol intravenously per hour to produce analgesia and euphoria without causing undesirable symptoms of alcohol intoxication. In most patients, 40 to 60 cc. of alcohol will produce sleep lasting two to five hours.

In the normal person, approximately 10 cc. of pure alcohol are metabolized per hour, regardless of the blood concentration. Intoxication may occur if the intake exceeds this amount. A solution of 5 percent alcohol contains 10 cc. of 95 percent alcohol per 200 cc. of fluid, and this amount is completely metabolized in one hour in the average human being. Alcohol administered in excess of 10 cc. per hour accumulates in the blood stream and produces the analgesia, euphoria, loss of anxiety and dulling of memory that are necessary for the best clinical results. Subjective signs are therefore the best guide to the rate of infusion.

Intravenous alcohol is especially useful in cases of nausea, vomiting and paralytic ileus, and for a short time the caloric requirements of patients able to take little or no food by mouth may be met by the use of dextrose, amino acids and alcohol causes patients to feel better, experience fewer complications and sequelae and make a more rapid convalescence. Since alcohol and dextrose increase the need for thiamine, riboflavin and nicotinic acid, it may be necessary to supplement parenteral nutrition with these vitamins when alcohol and dextrose are administered as a source of calories. Vitamins can be added to the alcohol solution without reducing potency.

Karp and Sokol state that complications from intravenous infusion of 5 to 10 percent alcohol have been of minor importance. No "hangovers" have been observed. Occasionally, too rapid a rate of infusion may cause restlessness and inebriation, but few patients have needed restraint. When inebriation occurs, reduction or interruption of the flow if followed by a return to the quiet state of well-being. Since the reaction of the nervous system to alcohol is not always predictable, patients receiving intravenous alcohol should not be left alone for long periods. Some may become excitable or irrational and require reassurance or restraint. The peripheral vasodilatory effect of alcohol can be harmful in the presence of shock or impending surgical shock, and intravenous alcohol should be used with caution in the presence of such conditions. Karp and Sokol do not give intravenous alcohol postoperatively to patients with demonstrable liver damage or a history of epileptic attacks.

Intravenous alcohol is no longer a subject for doubtful humor about "cocktails I.V." It has been assured a valua-

Spark-proof Coating for Existing Operating Room Floors

OF serious concern in hospital operating rooms is the hazard of static electricity. Ever present is the danger that friction sparks in the presence of gases, vapors or dusts could result in fire — or worse — an explosion.

It is known that conductive floors effectively combat this menace. Yet, sadly, too few hospitals are financially in a position to undertake the expense of removing and replacing existing floors.

The Walter G. Legge Company, Inc., New York, has created a spark-proof coating which, when applied to existing floors of terrazzo, ceramic tile or cement finish makes them conductive of electricity. The coating, known as Conducote, is a plastic-like composition reported to be effective on every type of floor excepting rubber and asphalt.

When thinned to a free-flowing consistency, Conducote coating is painted or troweled over the entire floor area. The Legge Company recommends that not less than 4 coats be applied. It dries to a smooth, even finish which is easy to maintain.

Although it might be feared a treatment of this sort might result in sombre-appearing floors, this is far from the case. The company manufactures a Conducote Finish which is available in red, green, brown, black and gray. When buffed, after polishing with Legge slip-resistant polishes, the floors are highly attractive. Legge Safety Polishes and Cleaners are recommended for subsequent maintenance since they retain conductivity.

The efficacy of this inexpensive method of producing conductivity is borne out by the fact that it is certified by both Underwriters' and Electrical Testing Laboratories. It meets the requirements of the National Fire Protection Association.

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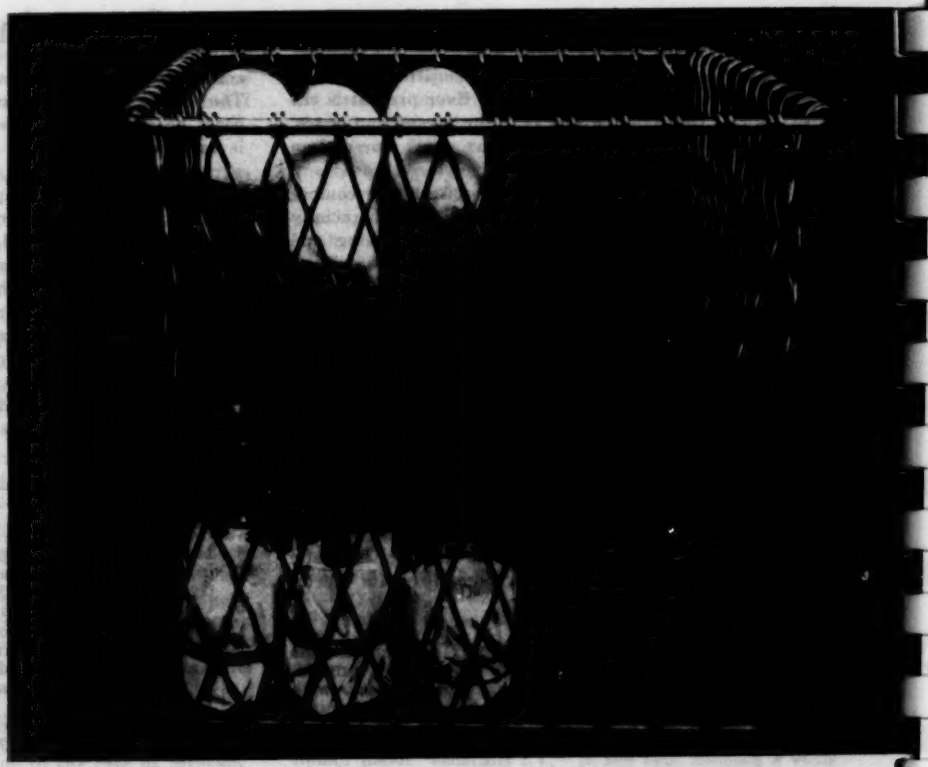
ble role in the postoperative management of surgical patients by the unanimously favorable and enthusiastic reports of investigators who have recognized its worth.

REFERENCES

1. Behan, R. J. (1945), Ethyl Alcohol Intravenously as Postoperative Sedative, Amer. J. Surg., 69:227, August.
2. Mueller, S. (1939), Use of Alcohol Intravenously with Special Reference to Its Value in Severe Peritonitis, Surg. Clin. North America, 19:401, April.
3. Adams, R. C. (1944), Intravenous Anesthesia, Paul B. Hoeber, Inc., New York, pp. 89-99.
4. Moore, D. C., and Karp, M. (1945), Intravenous Alcohol in the Surgical Patient. A Preliminary Report, Surg., Gynec., & Obst., 80:523, May.
5. Grabill, F. J., Hockmuth, L., and Tuohy, E. B. (1950), The Intravenous Use of Alcohol in Surgery, Anesth. & Analg., 29:211, July-August.
6. Karp, M., and Sokol, J. K. (1951), Intravenous Use of Alcohol in the Surgical Patient, J. Amer. Med. Assn., 146:21, May 5.
7. Rice, C. O. (1949), Intravenous Therapy, West. J. Surg., Obst. & Gynec., 57:239, June.

THE CARE OF AMPOULES

By Edith Dee Hall, R

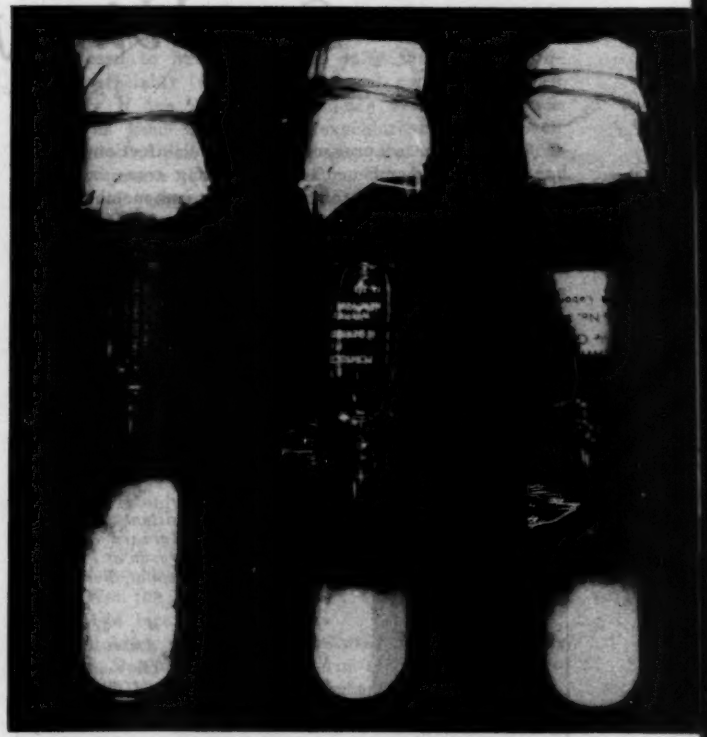


A COMMON practice in many institutions, as well as in the New York Polyclinic Hospital, has been to soak ampoules containing drugs for spinal anesthesia in a germidical solution. A dye or coloring is added to this solution so that a flaw or leak into the ampoule may be detected.

Not too long ago the head of the anesthesia department brought an ampoule, with a slight discoloration, to the attention of the nurse in charge. He expressed a fear that such a slow leak might go un-noticed under artificial light, especially at night on an emergency operation.

With the cooperation of the anesthesia department we set about finding a safer method of sterilizing ampoules. Since chemical sterilization is always under question we decided to detemine whether or not it is permissable to autoclave ampoules containing Nupercaine, Procaine, Pontocaine etc. Companies manufacturing these drugs were contacted each giving the same answer, that the products may be autoclaved.

A simple and easy method was devised. Each ampoule is placed in a glass test tube the tip resting on a small piece of cotton in the bottom of the tube. A double paper cap covers the open end of the tube and is held in place by a rubber band. If desired the date may be written on this paper. No labeling is necessary as the labels on the ampoules can be easily read through the glass. Test tubes are placed upside down in a wire basket for autoclaving. Ampoules containing glucose should not be autoclaved more than once and it advised that others should not be run more than twice. Autoclaving at 15 pounds pressure, 250 degrees Fahrenheit for five minutes is recommended.



*Scrubbing for Surgery**

By Dr. Carl W. Walter

● The problem of preoperative skin disinfection for the hands of any member of the operating team is an individual one which is related to the team member's frequency and pattern of scrubbing, the nature of the contamination of his hands, and the routine hand washing technic which he practices. New synthetic detergents and germicides have made less time-consuming technics safe and feasible for all individuals.

The normal bacterial flora on an individual's skin varies in different parts of the body. In protected regions, such as in creases, the bacteria may be numerous. On smooth exposed surfaces they may be few. Every individual's skin is normally inhabited by a basic population of saprophytes which is characteristic of the individual. Contamination of the skin will introduce new bacteria which in time may adapt themselves and become residents.

The transient flora of the skin usually reflect an individual's occupation and avocation; they gather along with soil. They adhere to the surface of the skin, collect in creases and subungual spaces, and are best removed by friction. Resident flora live in the hair follicles and skin glands and are impossible to remove mechanically.

The more superficial bacteria can be mechanically removed from the skin because they are actually rubbed off with friction. The rate at which bacteria are removed depends on the amount of friction employed. The transient organisms are easily removed along with the fat, grease, and soil that harbor them. Once the bacterial flora on the skin has been reduced to a minimum by scrubbing, regrowth occurs slowly over the course of days (1).

Skin which is scrubbed or disinfected daily always yields a lower bacterial count than that which is disinfected only occasionally. New technics of preoperative skin disinfection are aimed at removing a maximum of dirt, oil, grease, and transient organisms in the shortest possible time.

Tap water is effective for skin disinfection because the few organisms in the water are not implanted on the skin. Similarly, wet skin is not easily contaminated be-

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**From Walter, C. W., "Scrubbing for Surgery", Amer. J. of Nursing, Vol. 52, No. 2, Feb., page 188-89. By permission, Amer. J. of Nursing.*

cause organisms that are picked up are easily washed away. Hence the extreme caution used with faucet handles and brush backs is misplaced. They may be handled safely with wet hands.

USE ANATOMIC SCRUB

Preoperative disinfection of the skin of the hands should be based on a systematic anatomic scrub which covers every area of the hand. The efficacy of arbitrary periods of scrubbing is too dependent on the human element to be safe. Nursing students, medical students, and surgeons who join the hospital staff are urged to take the scrubbing test described by Dr. Lilienthal (2). In this test 10 percent lampblack mixed with salad oil is rubbed into the hands and forearms. The student is blindfolded, provided with soap, brush, and running water and instructed to scrub until he thinks his hands are clean. The results are enlightening and serve as a guide for improving each individual's scrubbing technics.

Mechanical scrubbing removes the transient bacteria and about one-half of the resident flora. Chemical disinfectants must be relied upon to destroy organisms remaining in the deeper layers of the skin, in the hair follicles, and in ducts of glands. A single application of a germicide will seldom achieve disinfection because the germicides that are usually used have fleeting action with little residual effect. Hexachlorophene, a comparatively new agent, has the added advantage of maintaining residual germicidal action on the skin bacteria so that they are gradually reduced to the vanishing point.

Hexachlorophene (G-11) is a bactericidal synthetic diphenol which is hypoallergenic, nontoxic, and effective in a weak dilution (3). It is not an effective "one shot" germicide. Its efficiency as an agent for a short preoperative scrub is dependent upon frequent use. While the actual mode of action is controversial, it is a well established fact that if the bacterial flora of the skin are exposed to hexachlorophene daily they will be reduced appreciably (4). The short scrub can be considered safe only if the detergent-germicide or soap-germicide mixture is used frequently. Hexachlorophene has been incorporated in bar soap, liquid soap, and the newer synthetic detergents. Data has been published on the relative efficiency of the various mediums.

At our hospital, hexachlorophene is added to pHisoderm, which is a mixture of sodium octylphenoxyethorxyethyl ether sulfonate, lanolin, cholesterols, and petrolatum, to make a 3 percent solution. pHisoderm is a thick, creamy fluid with a pH of 5.5 which is approximately that of normal skin (5). It lowers the surface tension of water, is an active emulsifying agent, and is about 40 percent more active than regular soap as a cleansing agent (6). It is non-allergenic and economical to use.

This is our technic for the preoperative disinfection of the hands:

1. Make certain that nails are trimmed so that the free edge is only 1 mm. wide.
2. Turn on water faucets and regulate the temperature and rate of flow.
3. Take brush from container.
4. Wet the hands and arms.
5. Add 1 cc. of pHisoderm.
6. Holding the brush "lengthwise," scrub thoroughly, using the following anatomic scrub so that every area of the skin receives the correct number of strokes:

a. For those who scrub at intervals of more than

Points for Safety in the Operating Room

The material below is reprinted from the Bureau of Mines Report of Investigations 4833. A copy of this report, titled, "Static Electricity in Hospital Operating Suites: Direct and Related Hazards and Pertinent Remedies" should be in the hands of every supervisor. Everyone entering an operating room should be familiar with the information below. Post this on your bulletin board where everyone can read it and send to Bureau of Mines, 4800 Forbes St., Pittsburgh 13, Pa., for a copy of the report.

Specific Conclusions

a. In the average operating suite there are many items of nonconductive material that singly or in combination permit and encourage the development of static electricity.

b. The presence of static charges can give rise to incendiary sparks and is a constant threat to patients and personnel in anesthetizing locations.

c. Many anesthetic gas mixtures, particularly those rich in oxygen, are highly explosive and easily ignited by static sparks. Some of the commonly used mixtures can be ignited by extremely low energy sparks of the order of 0.001 millijoule—less than a millionth of a gram-calorie.

d. There are a number of simple ways of preventing the development of static electricity in operating rooms, the most important being the subsitution of articles

of electrically conductive material for those of nonconductive, charge-producing material. Whether or not all of these substitutions are made, conductive floors and conductive contacts from equipment to floors should be provided to take care of any exigencies, such as the possible introduction into the operating room of some piece of unapproved material electrically charged or likely to become charged.

e. In operating suites that still have easily charged materials lying around, the quantities of induced charge apt to be produced and the potentials involved are such that neutralization can be brought about satisfactorily by conducting paths of fairly high resistance.

f. Floors and shoes of unnecessarily low resistance may give rise to spark and shock hazards in rooms where there are ordinary electrical appliances and portable lamps.

g. The use and proper installation in anesthetizing locations of electric lamps, motor, plugs, and receptacles that carry a third wire for positive grounding would reduce greatly the chance of personnel or patient receiving electric-power shock.

h. The correct amount of resistance in a static-charge neutralizing or ground circuit can be determined with adequate margins of safety from a knowledge of the rate of development of charge potential. Dangerous charges commonly require more than 0.1 second to develop.

i. As charge removal accompanies charge development on ground-connected personnel and equipment, conductive paths capable of removing or permitting neutralization of 99 percent of any probable charge in 0.01 second will give a large practical margin of safety. Neutralization of developing charges on personnel or equipment in operating rooms or other anesthetizing locations can be adequately and safely accomplished in circuits of several megohms resistance.

(Continued on next page)

j. Application of preventive measures must be thorough to assure complete removal of the static-electricity hazard from anesthetizing locations.

Specific Recommendations

1. Wool blankets, plastic sheets, and most of the usual synthetic-fabric materials should not be used around anesthetic-gas equipment or patients anesthetized with combustible-gas mixtures. Cotton blankets and sheets are satisfactory, but if these are stored in a warming compartment some means should be provided to keep them from losing moisture. Before new types of materials are admitted to operating-room or delivery-room suites, they should be rigorously and completely tested under conditions of low relative humidity to be sure that they cannot readily develop high-potential charge.

2. Conductive rubber mattresses, pads, and pillows should be substituted for the ordinary variety as soon as they are available. Conductive mattresses are strongly recommended for carriages, especially where nonconductive floors are still in use. Conductive covers are satisfactory if they completely and permanently enclose the nonconductive items. Conductive cover material is becoming available and should be put to use speedily.

3. Personnel wearing ordinary rubber or synthetic soled shoes may carry static, regardless of the type of floors. Conductive shoes, therefore, should be worn by all personnel who work around combustible anesthetics or anesthetized patients. Such shoes should have a resistance of not less than 0.1 megohm each, but they should not have or acquire an individual resistance of more than 0.5 to 1.0 megohm. Until approved conductive shoes can be obtained, leather shoes, unless they have rubber insoles or waterproofing, will usually suffice to bring about neutralization of body charges quickly. If the leather soles are reasonably conductive and recommendations 1, 5, 6, and 8 have been put into effect, the hazard introduced through the use of ordinary rubber or composition heels may be regarded as insignificant.

4. Suitable conductive-rubber breathing tubes, masks, and bags should be installed on existing anesthesia machines as soon as they can be obtained they should be standard equipment on all new machines.

5. Conductive floors should be used in all operating and delivery rooms and in other rooms where combustible anesthetics are administered. An effort should be made to keep floors within the limits of present code requirements, and well above the lower limit. The opinion of the authors, based on many tests and considerations, is that the most satisfactory well-seasoned floors will introduce in any neutralizing circuit or to the ground a resistance of not less than 0.2 megohm nor more than 2.0 megohms. Such floors will remove static charge adequately from any conductive bodies properly connected to them and prevent disconcerting, if not dangerous, shock due to possible defects in electrical equipment such as lamps and heaters.

6. Stools with smooth, rounded feet and bare-metal tops are the most satisfactory ones electrically. If upholstered covers are needed for comfort or to prevent sliding or falling, they should be of conductive material. If stool tops are painted or enameled these coatings should be removed. Wide cross straps of adhesive tape, sometimes used to prevent sliding, are not objectionable, but at least 50 percent of the bare top surface of the stool seat should be left exposed.

7. Nonconductive casters, tires, and stool-leg tips should be replaced by conductive rubber or other suitable material on all equipment used in the administration of combustible anesthetics or in the handling of anesthetized patients. If these cannot be obtained from the manufacturers of hospital supplies, wet towels to insure removal of static electricity from operating table, anesthesia machine, stool, and anesthetist should be used. Until it is possible for a hospital to install conductive floor in all hazardous areas, it is advisable to use wet towels in any instance, as they are much more effective in conducting electricity into floor materials of high resistance than

any other method; as noted on page 24, wet towels can also be used effectively on carriages. If 1-megohm resistance-type intercouplers are employed they must be kept in good repair and tested frequently.

8. Other garments of wool, silk, or synthetic materials, such as rayon, nylon, orlon, etc., should be prohibited in anesthetizing locations. However, there seems to be no substantial evidence that personnel acquire static charge potentials as a result of wearing properly covered undergarments of these materials. Cotton uniforms are more suitable from an electrical standpoint than those of other materials because they retain a useful degree of conductivity at fairly low humidities and because they are not apt to produce or acquire charge by frictional contact with other cotton articles, such as sheets, bandages, sterilized bundles, etc.

9. Receptacles and plugs that cannot be pulled apart accidentally should be installed where needed. Unless they are of the explosion-proof type they should not be placed lower than 5 feet above the floor or in any location where combustible anesthetic gases can pass over them or envelop them. Care should be taken to keep ordinary switches and open motors and heaters well out of range of combustible gas mixtures. Electric wiring and equipment should be in conformity with the latest approved regulations of the National Fire Protective Association for hospital operating rooms wherever possible.

10. A suitable measuring instrument (see section on instrumentation) should be installed in a convenient and safe place for testing the conductivity of shoes of all personnel entering areas where explosive gaseous anesthetics are administered. If conductive shoes cannot be obtained, shoes of leather or other absorbent material usually can be brought to a desirable value of conductivity in a few minutes by standing on a wet pad or piece of wet carpet. A little glycerin or hygroscopic salt, such as calcium chloride, in the water will give the treatment more permanence.

The authors believe that these recommendations for reducing to a minimum static-spark and ordinary electrical hazards in hospital anesthetizing areas are pertinent, practical, and essential.

A General Review of SURGICAL NEEDLES

By Edith Dee Hall, R.N., O.R.S.

● It is important to know the general classification of needles, their shapes, points and size so that specific instructions can be quickly understood and followed. It is not always possible to determine ahead of time what needles will be used in certain surgical cases. The surgeon's needs or preferences, at the moment, may designate the needle to be used as well as the type of operation, itself. As a consequence, a steel needle rack, cotton needle book or folded towel with a large quantity of miscellaneous needles is usually required.

The type of needle is indicated by its special functions, i.e. gastro-intestinal eye, general closure, etc. Sometimes the type of needle is known by the surgeons who popularized the needle, i.e. Murphy—intestinal, Mayo—intestinal, etc.

There are four shapes of needles, ⅜ circle, ½ circle, half curved and straight.

There are five points of needles, cutting edge, triangular, trocar, taper and blunt. The blunt point is not often used.

Size designation of eyed needles is somewhat confusing because there are several designations used. Size numbers can go from 00 to 2-0 and are so arbitrarily set that a Size 1 needle of one type has no relationship to a Size 1 of another type.

Curved needles are sometimes measured from one end across to the other end. This span is called "chord." The measurement of "chord" is one accurate way to determine the relative size of one needle compared to another.

Very often when the length of a curved needle is indicated in inches, in a catalog of eye needles, the length refers not to the length or "chord" shown, but the length before bending.

The thickness or wire diameter of needles is sometimes indicated by measurement of wire diameter, expressed by thousandth of an inch. Widely used general surgery needles range from .015" to .050".

Often as the length or size of the needle is reduced the wire size is also reduced.

Some of the suture manufacturers attempt to reduce confusion of needle sizes through improved design and temper of steel which obviates the need for so many sizes. For instance, a needle which is properly tempered will be very rigid for its size and will bend before it will break. Needles which will not break can be smaller in diameter since the extra size is usually insurance against brittle

needles which do break. The fact that properly tempered needles can be just as strong as larger poorly tempered needles explains why some smaller needles can be used in place of larger needles. Suture manufacturers have also devised eyeless needles which cause less damage than eyed needles by eliminating the eye and second strand of suture.

The growing use of swaged needles in all phases of surgery has made them almost as universal as eyed needles. The original application of swaged needles was in surgical specialties like ophthalmology and gastroenterology where it was particularly necessary to use a needle and suture which caused minimum tissue damage.

With the adoption of finer sutures and emphasis on careful tissue handling, needle improvement has been a natural step. The characteristics of different brands vary more than one might suppose. Steel, temper, and design may be totally different in needles which appear to be quite similar. Actually the temper should be the finest, since broken needles mean delays and perhaps broken ends lost in the patient's tissue. Dull needles, bent points, nicks in the cutting edges cause tissue damage as well as exasperating the surgeon. Even the eye of a needle (if not eyeless) must be perfect, otherwise they cut or fray the suture which is threaded through it. The ultimate in needle design is an eyeless needle which will carry only a single strand through the tissue which is perfectly shaped or pointed and which is well tempered so that it will bend only after extreme pressure is applied but will not break.

Manufacturing economy and the recent spiral of hospital labor costs have encouraged the use of swaged needles. Of course, the surgical advantages continue to make them desirable.

STANDARDIZATION

The technical improvement of swaged needles and their in-use advantages have prompted the development of needle standardization programs in a number of hospitals.

With a standardization and simplification program fitted to your staff's requirements, you can streamline your suture stock and substantially reduce your investment and actual suturing service costs.

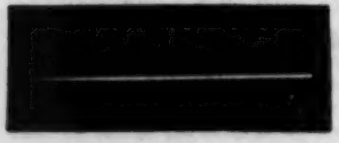
The task of buying and caring for extensive stocks of eyed needles can be practically eliminated. Nurses can be freed from the time-wasting chore of preparing eyed needles and threading sutures on them.

No one institution needs all the available needles, but according to its habits and preferences, any hospital can install a simplified line that will meet 90% or more of its suture requirements.

Surgeons and nurses, working together, can accomplish a great deal in this matter. As always, the patient is the first consideration. If swaged needles are used, preventing trauma to tissue and saving time during the operation, the result is better service to the patient. In many instances suture tubes are broken and needles threaded before the operation starts. It is often necessary for a surgeon to break his routine and use different sutures, thus wasting the ones already prepared. Tubes with swaged needle sutures can be broken as they are used thus facilitating an economy of time and material. If general surgeons knew that routine needles, within a limited range, were swaged on the usual sutures, they would prefer them to all others regardless of a slight change in the curve or size of the needle. Certainly the nervous nurse would be greatly relieved.

Surgical Specialities and the Physical Characteristics of Needles Which Are Most Apt To Be Required (needles pictured are actual size)

TYPE	SHAPE	POINT	SIZE
Arterial	straight ½ circle	always taper	small, fine
Cervix	½ circle	cutting	strong, large
Circumcision	⅜ circle	always cutting	small, medium large
Cuticular	⅜ circle (most popular) half curved ½ circle straight	always cutting	from fine to sturdy from short to long depending on surgical problem.

TYPE	SHAPE	POINT	SIZE
Eye (Muscle)	3/8 circle (usually) single or double armed	usually cutting	small
Eye (Cornea)	3/8 circle single or double armed	taper & cutting	very fine
Fascia	1/2 circle	usually taper	strong
Intestinal	1/2 circle	always taper	always fine in diameter—small, medium large in length
	straight single or double armed	always taper	short (variable) regular (1 3/4" - 2") long (over 3" for use with special clamps)

TYPE	SHAPE	POINT	SIZE
Muscle	½ circle	usually taper	strong
Nerve	⅜ circle	always taper	small, fine
Perineum	½ circle	taper & cutting	strong, large
Peritoneum	½ circle	taper	usually the same size as those used on fascia and muscle

(Continued on next page)

TYPE	SHAPE	POINT	SIZE
Stomach	⅜ circle	always taper	fine
	½ circle	always taper	fine, large
Tendon	⅜ circle	taper or cutting	small, strong
Thyroid	½ circle	taper	fine, medium (gastro-intestinal)
Tonsil	½ circle	taper	strong
Uterus	½ circle	usually cutting	strong, large

Quotable Quotes

Excerpts from the wide span of medical and nursing literature, designed to save time for the busy Operating Room Supervisor.

Prevention of Postoperative Pulmonary Infections

John A. Dixon, M.D., Salt Lake City, Utah and Earle B. Mahoney, M.D., Rochester, New York

Micronized penicillin was given by inhalation preoperatively and postoperatively to a series of 150 thoracic and upper abdominal operative cases in an attempt to prevent postoperative pulmonary infections.

In the series, there were eight complications including a bronchopneumonia and seven cases of atelectasis, for an over-all morbidity of 5.3 per cent. This compares with a complication rate of 19 per cent in a series of untreated cases at the same hospital.

Atelectasis is the primary cause of postoperative pulmonary infection. Collateral ventilation prevents the development of atelectasis except in the presence of shallow breathing. or pulmonary inflammation. Shallow breathing is eliminated by established methods.

The authors conclude that micronized pencillin by inhalation is an agent of considerable value in the reduction of pulmonary inflammation when used prophlyactically in the operating case.

Micronized forms of some of the newer antibiotics which are active against the gram-negative organisms may further extend the usefulness of this method. *(From the Rocky Mountain Medical Journal, Vol. 49, No. 2, February, 1952, P. 122.)*

Surgery in the Older Patient

H. H. Bradshaw, M.D., Winston-Salem, N.C.

In preparing geriatric patients for surgery, they should be properly hydrated, and blood volume and protein reserves made adequate. If necessary, feedings may be given through an indwelling gastric tube.

Fluids given intravenously must be given very slowly to avoid circulatory overloading. The subcutaneous is much safer, and should be used more often. Even fluids with some calorific value such as glucose and protein hydroly-

sates can be safely given by the subcutaneous route.

Patients should not be allowed to remain in bed. They should be urged to go to the bathroom and to walk about the ward.

Many physicians have an inordinate fear of administering sedatives, especially morphine, to elderly people. Demerol, dilaudid or methadon are excellent substitutes.

Intravenous pentothal sodium has proved itself a boon to old people. Complicated gas machines may be frightening, and a mask is more disquieting than the prick of a needle. It should not be used in cardiac decompensation and in operations requiring much relaxation.

Spinal anesthesia is very useful in old people. It must be remembered that even though their vessels may be quite inelastic, they may have a profound fall in pressure.

Pressor drugs should not be given to hypertensives until the spinal needle is actually within the dura, and spinal fluid can be freely aspirated.

When an inhalation agent of any kind is to be given to an old person, his comfort is greatly increased if unconsciousness is induced with pentothal, followed by any other anesthetic selected. *(From the Journal of The Medical Association of Georgia, Vol. XLI, No. 1, January, 1952, P. 4.)*

False Faith in the Surgeon's Gown and Surgical Drape

Editorial by William C. Beck, M.D. and Thomas S. Collette, B.A.

One or more layers of cotton sheeting or toweling are often assumed to be an effective barrier between a non-sterile instrument table and the sterile instruments used in the operation, and between the patient's body other than in the prepared area and the sterile field.

Experiments have indeed proven the validity of these assumptons under the condition *that they are dry*, but if they become wet, all of the layers of cloth become sieves to the passage of bacteria.

Since wet cloth is not a barrier against bacterial contamination, we must adopt certain changes in technic which will obviate this hazard. It would seem simplest to replace all cloth with an impermeable waterproof material. This is not the answer, nor is it desirable. If the skin of the patient or of the surgeon is incapable of "breathing" there will be increased perspiration and intolerable heat. We are at present experimenting with waterproofing materials which preserve the porosity of the cloth.

Probably much can be accomplished, however, merely by the recognition that *a wet drape is a contaminated drape*. The instrument tables should be covered by a waterproof sterile drape or the entire tray should be sterile. If moistened packs are necessary at the wound margins, these should be well wrung out so that they will not moisten the drapes beyond the prepared field.

They should be narrow enough or so placed that they are in contact only with the prepared area of skin. Ideally, they should also be isolated from this skin by a narrow piece of waterproof material which has been placed over the "wound towels." If the surgeon's gown has become wet by water, blood or amniotic fluid, it should be changed. *(From The American Journal of Surgery, Vol. LXXXIII, No. 2, February, 1952, P. 125.)*

Air-Borne Infections in the Operating Room

by Harry C. Lapp, M.D.
Kansas City

● Surgery of the present day is the result of a slow but progressive development over centuries. Although trephining was widely practiced, and frequently successfully, as early as 1000 B.C. by the Egyptians, rhinoplasty and cataract operations were common in India, and laparotomies were frequently done in China as early as the second century A.D.—yet modern surgery is still in its infancy, having its inception less than a century ago.

In preantiseptic or preaseptic times, sepsis was considered an inseparable companion of surgical procedures. The mortality rate in the eighteenth century was 80 percent, and during the following century 50 percent. Compound fractures, even in the skilled hands of Lister, carried a mortality of 45 percent.

About 1860, Pasteur repudiated the idea of spontaneous generation of organisms by demonstrating that fermentation of wine was due to contamination by minute organisms. In 1864, Lister applied the principle to wound infections, and, since he felt that infections were due in large part to air-borne organisms, he employed a phenol spray in the operating room. He also used a weak phenol solution as a hand wash, and cleansed the operative field with it. By such crude methods, he reduced his compound fracture mortality to 15 percent.

Sterilization of inanimate objects used in the operative field has progressed until there is but slight danger of contamination from this source.

Skin disinfection of the operative site and the operator's hands have likewise improved steadily. The recent addition of hexachloraphene to soap has improved disinfection of the hands.

Many surgeons are of the opinion that present day surgical preparation and sterilization has reached its peak and that contamination of clean wounds rarely occurs. Frank J. Meleney, Presbyterian Hospital, New York City, reviewed the records of that institution and found that

15 percent of the clean cases developed some infection. Eight serious hemolytic streptococcic infections occurred in 1925. Nasopharangeal cultures of the surgical staff revealed 33 percent harbored these organisms. Rabbit inoculations and agglutination tests with the various strains apparently incriminated the surgical nurse as the carrier of the offending contaminant.

STREPTOCOCCIC CARRIERS

J. J. Walker, in 1927, reported three deaths in clean cases at Boston City Hospital. Fifty percent of the operative team were found to be streptococcic carriers. Since then, all surgical personnel have throat cultures monthly during the summer and semimonthly in the winter. All carriers are excluded from the surgical pavillion.

Wainwright collected a series of 365 deaths from tetanus occuring in postoperative abdominal and gynecological cases. Robinson, in 1946, reported two fatal postoperative cases of tetanus, apparently due to air borne contamination from a field adjacent to the operating room. S. Sevitt, in 1949, also reported two fatal cases of postoperative tetanus, probably due to contaminated animal hair used in the plaster during the remodelling of the operating room.

Innumerable articles have been published which prove beyond any doubt that droplet and dust borne contamination are a serious source of infection.

Deryl Hart, of Duke University, stated that "pathogens in air contaminated by human beings are responsible for most of our operating room infections."

Meleney estimated that the average operating table and sterile instrument table contained 4,000 to 7,000 square inches, and he found that during one hour in a busy operating room, an average of 35,000 to 60,000 bacteria fell on this area.

Droplet infection results from coughing, sneezing, or talking. Direct contamination occurs only over a limited area of about two to three feet. Michaelson estimated that a single sneeze may liberate 100,000 organisms. These organisms descend at a geometric rate. Streptococci settle approximately 20 percent per hour. Thus, at the end of 24 hours in a quiet room, only about 0.5 percent remain suspended. These organisms may remain viable for some weeks, mix with dust, and be redistributed. Michaelson claims that pollution from the human respiratory tract may be indicated by the presence of alpha streptococcus, which occurs in saliva in a concentration up to 10 million per c.c. The average mask in use is grossly inadequate to prevent droplet infection. Blatt and Dale have practically eliminated this source of contamination by inserting a single layer of cellophane in a gauze mask, which must of course cover the nose and mouth completely.*

Numerous observers in England and America have demonstrated that the bacterial count in the air rises rapidly in proportion to the number of occupants in the room and their activity. Likewise, sweeping a room re-

*There is another school of thought on the matter of impermeable masks which says, "The use of impermeable material as a mask is not desirable because the expired air is simply deflected around the edges of the mask and the atmospheric dissemination is the same as if no mask is worn." (from L. Arnold, "New Surgical Mask; Bacteriologic Air Filter", Archives Surgery, 37: 1008-1016: 1938). This is quoted in Dr. Carl Walters "Aseptic Treatment of Wounds", page 190.

distributes innumerable bacteria into the air, which remain suspended for hours. Bedmaking also liberates innumerable air-borne bacteria. Van den Ende demonstrated that these dust borne bacteria could be markedly reduced by a simple process of oiling the floors and bed clothes. Light spindle oil applied to the floor weekly and an oil rinse of blankets about once a month eliminated over 90 percent of bacteria freed from these surfaces, according to Cruickshank. Such an oil rinse remains effective a month and cannot be detected by touch or smell. Hard surfaces, such as tile, may become slippery if oiled, but may be treated efficaciously with 5 percent urea, 3 percent ninol, and 0.9 percent Rocall semiweekly.**

Bacteria present in the operating room may be destroyed in several different ways. Ultra violet light, when properly employed, is quite effective. Anderson states that ultra violet light of 2537 Angstrom units will practically sterilize the air in an unoccupied room. Since the light, however, is extremely irritating to the eyes and exposed parts, goggles and hoods must be worn. These protective devices interfere with operating efficiency because of excessive heat and fogging of the goggles.

Such light rays, if directed parallel to the floor at a seven foot level, will sterilize the upper air, and, by the addition of circulating fans, all of the air borne bacteria can be subjected to these rays. Two watts radiation per 1,000 cubic feet is required for sterilization.

Improperly adjusted ultra violet lamps, producing 1849 Angstrom units, liberate excessive amounts of ozone. Although city air contains about .01 part of ozone per million, and as little as .04 parts per million can be detected by smell, an increase to 0.4 parts per million is quite irritating to the nose and throat. Contrary to common belief, ozone has no value in disinfecting air.

Deryl Hart, by employing ultra violet light in the thoracic surgical pavillion, has reduced the mortality one-half, and has been able to dispense with drains in clean cases.

Air-borne bacteria can also be destroyed chemically by germicidal vapors. Halogens, hypochlorites, lactic acid, and other hydroxy acids, hexylresorcinal and the glycols have been tried. Triethylene glycol is the one most widely used. It is effective against many filterable viruses and numerous pathogens, and is nontoxic as used. This glycol is effective only in a relative humidity of 20 percent to 50 percent.

Hayward Post states that one c.c. of triethylene glycol

**ED NOTE: "Operating rooms must be kept scrupulously clean with soap and water. The use of dust-free cleansers is imperative and surgeons must avoid scattering talcum powder because such particles contribute greatly to the dust in the air. Cleaning should be done by vacuum, preferably with the type of cleaner in which the exhaust is discharged outdoors. Dry mops and brooms must not be used. Cleaning should be done at least an hour prior to operation so that there is ample time for bacteria to settle from the air before the sterile field is exposed. Wood floors and those covered with linoleum can be treated with spindle oil to allay dust. One liter of the oil is applied to 30 square meters of surface which has been scrubbed clean. The oil is noninflammable, odorless and not slippery when dry. Applications must be made two and five weeks after the initial oiling, thereafter at intervals of seven weeks." (from Dr. Carl Walter's "Aseptic Treatment of Wounds", pub., Macmillan Co., p 191).

per 10,000 cubic feet, or about 4 parts per billion, is fatal to pneumococci, streptococci and influenzal bacilli.

USE LACTIC ACID TO REDUCE COUNT

Lactic acid has frequently been used. It is quite inexpensive, and, in concentrations of .08 to 0.11 mg. per cubic feet, reduces bacterial count one half.

The two previous methods of air sterilization are quite satisfactory in the unoccupied room. Robertson found that 70 percent of the air-borne bacteria were destroyed by these vapors alone, and, with the addition of dust control, 90 percent of the organisms were eliminated. Unfortunately, human occupants rapidly contaminate such a room. The danger of such contamination depends on many variables, such as the number of occupants and their activity, their state of health, and on measures employed for dust, lint, and droplet control, etc.

The human body is capable of withstanding considerable contamination with relative impunity. However, if the resistance is lowered by a debilitating illness, serious injury, etc., the danger from contamination is more prone to occur when wounds are extensive, whether due to trauma, surgery, or burns, or when the operative procedures are prolonged. Burn cases are initially subjected to shock, and may subsequently develop anemia. The local resistance of the tissues is impaired by the trauma of the burns. Such cases often succumb to infection.

NO-TOUCH TECHNIC

Bourdillon and Colebrook reported, in **The Lancet** in 1946, an excellent method of reducing such infection. Their observations were made in the burn unit of the Birmingham Accident Hospital. They employed all the usual methods for the prevention of cross infection, such as strict no-touch technic, wearing of masks, oiling of floors and bedclothes, reduction of traffic to a minimum, closed windows, no sweeping for a half hour prior to dressings, uncovering only one area at a time, etc. In spite of such measures, considerable cross infection, or added infection, occurred. Their most important contribution was the development of a circulating air system, capable of removing the air-borne bacteria rapidly.

This consisted of a ventilating plant. The air intake was placed on the hospital roof, where bacterial content is the lowest. The air was passed through innumerable filters of increasing fineness to remove particulate matter. It was sterilized by being passed over thermostatistically controlled steam heated grills, and also was automatically humidified by steam jets. It was then forced through orifices near the ceiling, into a closed dressing room, and escaped through a space beneath the door, and was discharged outside. The circulation was produced by a plenum system, i.e. a positive pressure fan, rather than an exhaust fan. The air exchange rate was about 20 times per hour, only about one third that of the average ventilating system, which produces a perceptible draft. With a positive pressure system, sterile air forced into the dressing room will escape through any opening into adjacent areas. Should an exhaust system be employed, contaminated air from neighboring rooms would be drawn into the dressing room. The temperature was controlled at 70 to 75° F, and the relative humidity at 50 to 60 percent. The fan was started one hour prior to dressings and continued one half hour after dressings. About five minutes was allowed between dressings.

From January 1, 1945, to June 30, 1945, 860 dressings were done on 103 patients. Only 7 developed acute infections,—3 with hemolytic streptococci and 4 with staphyloccus aurens. In addition, silent contamination was discovered in about 10 percent,— silent, since no infection was apparent, but organisms were discovered not previously cultured from the wounds. These infections occurred almost entirely in cases difficult to keep covered, due to the location of the burn or the age of the patient. Many of them undoubtedly occurred outside the dressing room. It was noted that large numbers of pathogenic bacteria were liberated when the patients' pajamas were removed. The numbers increased markedly with the length of time the night clothing had been worn. Since only 7 percent of the burn cases developed any or additional infections under the method employed, it would appear that this method of air sterilization and circulation has great merit and should be used more widely in the care of burns, and also during the course of the more serious operative procedures.

There are a number of measures readily available to further reduce operating room contamination. In my opinion, the method usually employed in powdering hands and gloves in the operating room is faulty, since large amounts of light powder are spilled on the floor, become mixed with dirt and bacteria underfoot, and may be carried by drafts to the sterile field. I believe this unnecessary hazard could be eliminated by dusting the hands over a sterile clothes hamper or in front of an exhaust fan.

Fans, used in hot weather to circulate the air, are a dangerous source of contamination.

Few hospitals require change of all outside clothing before entering the operating room, although, shoes and clothes contain many dangerous pathogenic organisms.

Meleney stated that, "theoretically there is an irreducible minimum of wound infection. We do not claim to have reached that point yet."

Unless we develop antibiotics which are infallible in destroying all pathogenic bacteria in a wound, I would suggest the following methods for reducing air-borne infections in the operating room.

1. Limiting the operating room personnel to those definitely required.
2. Excluding personnel with acute respiratory infections.
3. Eliminating street clothing and shoes from the operating room.
4. Treating the floors and operating room bed clothing with a dust and lint allaying preparation at stated intervals.
5. Masking all surgical personnel with impervious masks and changing masks at frequent intervals.
6. Powdering hands over a clothes hamper or near an exhaust fan.
7. Sterilizing the air by ultra violet light or aerosol preparations.
8. Eliminating open windows and the use of ordinary fans in the operating room.
9. Installing, if possible, for the more serious operative procedures, a filtered, plenum circulating sterile air system.
10. Cleaning the operating room with a vacuum and keeping mops and brooms out.

BIBLIOGRAPHY

1. History of Surgery—Leonardo, pub., Froben: 1943

(Continued on next page)

2. Freeman, B. S. Arch. Surg., 61: 6, Dec. '50, pp 1145-1150.
3. Meleney, Frank J. S.G.O., 60: 1935, p 264
4. Walker, J. J. S.G.O., 50: 1930, pp 266-270.
5. Robinson, D. T. Lancet 1: Feb. 2, '46, pp 152-254.
6. Sevitt, S. Lancet 2: 24, Dec. 10, '49, pp 1075-1078.
7. Hart, Deryl Arch. Surg. 34: 1937, p 874.
Hart, Deryl Arch. Surg. 37: 1938, p 521, p 956.
Hart, Deryl Jour. Thoracic Surg. 7: 1938, pp 525-535.
Hart, Deryl Jour. Thoracic Surg. 6: 1937, pp 45-81.
8. Robertson, O. H. J.A.M.A. 126: 16, Dec. 16, '44, pp 993-1000.
9. Michaelson, I. D. Memphis Med. J. 19: Dec. '44, pp 178-181.
10. Blatt and Dale S.G.O. 57: 1933, p 363.
11. Van den Ende, M. Brit. Med. J. 1: p 941, p 953.
Van den Ende, M. Lancet. 11: 1941, p 755.
12. Cruickshank, R. J. Path. Bact. 41: 1935, p 367.
Cruickshank, R. J. Brit. Med. J. 1 Sup., pp 611-614.
13. Anderson, Wm. T. Hosp. Manag. 63: 4, Apr. '47, p 76.
Anderson, Wm. T. Am. J. Pub. Health 40: 5, May '50, pp 82-88.
14. Post, Hayward Am. J. Opth., Series 3, 29: 1946, pp 1435-1446.
15. Bourdillon, R. B. and Colebrook, L. Lancet 46: Apr. 20, '46, pp 561-565.
Bourdillon, R. B. and Colebrook, L. Lancet 46: Apr. 27, '46, pp 601-605.
Bourdillon, R. B. and Colebrook,, Brit. Med. J. Jan 10, '44, pp 791-792.
16. Peltier, L. F. The Jour. Lancet 70: 11, Nov., 1950, New Series, pp 442-444.

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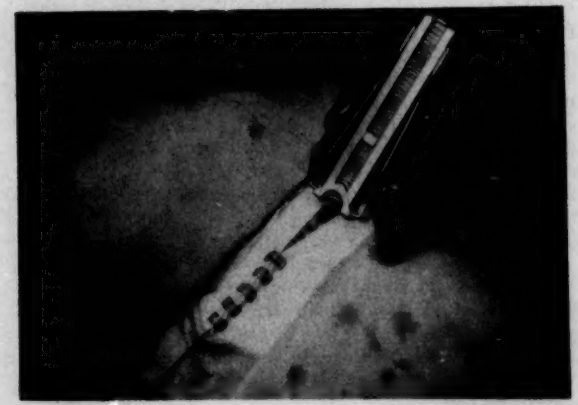

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Anesthesia Studies of New Agents and Technics

By Robert A. Hingson, M.D., Professor of Anesthesia
Director, Department of Anesthesia
and
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● In our department we are responsible for more than thirteen thousand anesthesias each year. While the great majority of our anesthetics are those utilizing the established and standardized agents of Ethyl Ether, Nitrous Oxide, Pentothal Sodium, Procaine for local and Pontocaine for spinal anesthesia, we are in the process of evaluating recently introduced inhalation, intravenous and local anesthetic agents as supplements and adjuncts for our established procedures. In some of these studies we are the primary investigators.

These agents include: Trichlorethylene as an inhalation anesthetic and an algesic, Wyamine (Mephetermine Wyeth) as a vasopressor agent, Xylocaine (Lidocaine Astra) as a Local, Extradural and Spinal Agent; Sodium Seconal as a basal and induction intravenous short acting anesthetic agent; Avertin as a basal intravenous agent preliminary to intubation and in peroral endoscopies; Hexamethonium Bromide as a sympathetic ganglion blocker to combat hypertensive crises and as an agent to produce controlled hypotension regulating bleeding in certain types of surgery.

With the nation-wide shift toward an increasing number of geriatric patients, we have given considerable more attention to the problem of this age group in such operations as orthopedic hip pinning procedures for fractures of the femoral neck.

The purpose of this paper is to summarize some of the advantages and disadvantages of these agents in our early studies. It is our desire that this preliminary report will supplement your own initial studies of these agents and assist you in determination of proper patient selection and in establishment of essential safeguards during the conduct of these anesthesias.

TRICHLORETHYLENE: This agent is a pleasant and effective volatile anesthetic capable of providing prompt analgesia and basal sedation in obstetrics, change of burn dressings, and dentistry when used in concentrations of .375 to .5 percent with air. It is best used in special inhalation apparatus regulating rate of volatization

on the basis of environment temperature. Light first plane anesthesia can be safely achieved with oxygen with concentrations approaching 1 percent. It should not be used with soda lime. It is non-inflammable at ordinary temperatures. It should not be used with epinepherin, but it may be successfully combined with nitrous oxide or intravenous barbiturate.

WYAMINE: This vasopressor agent was first developed at Western Reserve University to use in shock and hypotension associated with coronary thrombosis. For more than a year we have used it in more than two hundred patients for the control of hypotension on the operating table either during a general inhalation or intravenous anesthetic and/or recently to support blood pressure during conduction anesthetics. The usual intravenous adult dose varies from 15 to 30 mgm. It is as promptly effective as ephedrine for a period of fifteen to thirty minutes in about the same dosage. Apparently there is no central nervous system stimulation associated with its use. We have not produced a single case of extreme undesired hypertension in treating this large series of patients largely during thoracic surgery.

XYLOCAINE: This agent from Sweden was introduced in America by one of us for local, caudal, peridural, topical, and spinal anesthesia. It is the most prompt and intense in local activity of our presently used local agents. Our daily schedule includes its use as a topical agent in cystoscopies from four to ten cases, and in surgery in at least four to eight cases. Its duration of action is about twice that of procaine, and its anesthetic potency is also at least 50 to 100 per cent greater than procaine. As a local it should not be injected in dosages greater than one half gram per hour. We have noticed that it frequently produces a tendency to light sleep in addition to its local qualities. This fact should be borne in mind when its use is combined with nitrous oxide or pentothal. We have used it in many patients who were sensitive to procaine without reaction. However, an occasional patient has a specific sensitivity to this agent also. Consequently, intravenous barbiturates, intravenous fluids, and oxygen should be readily available to combat this occasional reaction.

SODIUM SECONAL: Intravenous induction of anesthesia with a barbiturate has been gaining favor rapidly during the last years. The pleasant sensation experienced by the patient is well appreciated. Since it is believed that vagal activity manifested occasionally by laryngospasm follows the use of the thiobarbiturates, we have been investigating the substituting of the oxygen containing barbiturates such as nembutal and more recently sodium seconal as an intravenous hypnotic agent.

Until quite recently, sodium seconal could not be used to advantage as an intravenous agent. Rapid decomposition made such impractical. Seconal sodium was used, however, extensively in premedication by mouth, and as a basal anesthetic agent administered rectally in children prior to inhalation anesthesia.

Since the advent of an improved solution of seconal sodium now fully stable in a polyethylene glycol 600 vehicle, this agent is receiving attention of a half dozen

American clinics who are pleased with its preliminary performance as an induction agent for general anesthesia and to allay apprehension and to provide sedation during spinal, local, and other major conduction anesthesia.

In our department during the past two months, we have used intravenous sodium seconal in 115 instances in patients with age ranges between six and 85 years. Twenty-three of these patients received a good measure of sedation from 75 to 200 milligrams of sodium seconal supplementing a spinal anesthetic; 92 patients received from 30 to 250 milligrams of sodium seconal as an induction agent; three of these patients had a history of alcoholism and one was a psychiatric patient requiring restraints because of agitation. All four of these patients were given 100 milligrams of sodium seconal in their own room preliminary to transfer to surgery; three of them were definitely sleeping upon arrival in surgery and the fourth had no memory of the preoperative events immediately after injection.

In only three of these 115 cases were there evidences of complication. Two patients became quite noisy and stimulated by the medication both preliminary to induction and upon emergence from anesthesia one and a half hours later. One 23-year-old female who received 150 milligrams of sodium seconal preliminary to induction with nitrous oxide, oxygen, and ether, subsequently received an additional 100 milligrams ten minutes later because of a slow induction; within two minutes, the patient developed apnea and required controlled respiration for an additional five minutes before her respirations were reestablished.

Thus far we have concluded that sodium seconal in polyethylene glycol for intravenous use has proved to be satisfactory as an hypnotic agent supplementing spinal anesthesia and as a basal anesthetic agent preliminary to anesthesia. Administration is simple and induction of general anesthesia is pleasant. Sodium seconal is compatable with curare preparations and can be used with the main inhalation anesthetic agents. Cyclopropane and ether can be used in smaller amounts during surgery in these cases. Good masseter muscle relaxation was obtained in all cases and inductions were shorter. There were no cases of increased vagal stimulation noted in this series.

INTRAVENOUS AVERTIN

Intravenous avertin was originally used purely as an induction technic giving approximately 45-60 cc. of either a 1 or 3 percent solution in the same way that Pentothal is used prior to general anesthesia by inhalational methods. It was first used in Oxford, England and was described by Macintosh and Pask in 1941, but a more important contribution to the knowledge of this technic was published by Thornton and Rowbotham in 1945. They described 264 cases, mainly of maxillo-facial injuries, in which the solution was given as a continuous drip, either as a 3 percent solution in physiologic saline, or as a 1 percent in 5 percent solution of glucose. Both solutions are satisfactory but the 1 percent has a greater flexibility in use and dissolves more readily in glucose. It rarely causes thrombosis in brachial veins in this strength, and this is a further reason to prefer the 1 percent to the 3 percent solution. The advantages claimed for the method are two: (1) Early relaxation of the jaw so that laryngoscopy and intubation can take place rapidly and without trouble, in patients who

might have active hemorrhage into the mouth, and (2) that it does not cause the same degree of laryngeal spasm that might be expected after the use of Pentothal.

Since that time I have seen it used in Oxford on a number of occasions, and have also used it myself. We have amused ourselves by making up "cocktails" of avertin, ether, flaxedil, curare, pentothal, and various other substances in different concentrations, with two or more components together. Induction with avertin is pleasant, recovery is comparatively rapid provided the administration is not carried on too long, but one must be constantly on the look-out for severe respiratory depression. Usually it is not sufficient to give muscular relaxation by itself for abdominal operations, and for this reason some muscle relaxant drug should be combined with it.

The only compilcations reported are of a very mild transient hemoglobinuria, or rather haematuria, which recovers without treatment and there is no evidence of serious damage resulting from its use. A second possibility is a primary cardiac failure suggested on the grounds of the chemical relationship between tribromethyl and chloroform.

In our clinic we have used intravenous avertin in only twenty cases. Most of these have been for endoscopy. In one patient with Ludwig's Angina in which the infection tumefaction prevented the patient from opening his mouth and partially obstructed his airway. Intravenous avertin in a 2½ gram dose permitted blind intubation through the nose in nine minutes. We have noticed also that the masseters are more easily relaxed with intravenous avertin and there is less likelihood of laryngospasm than with pentothal.

It is necessary, however, to use this technic only in those cases with good veins, large enough to take a fast drip through an 18 gauge needle, in order to secure a circulating blood level quickly.

The average dose of intravenous avertin required for surgical anesthesia permitting endoscopy, drainage of neck abscesses and for induction and intubation has varied between 2½ grams and 4 grams in the average adult. When compared with the same estimated dosage requirements of these same individuals with rectal avertin, the intravenous dosage was about one-half as much. Furthermore, a more definite control of anesthetic depth could be obtrained. As a disadvantage, however, we should mention that two of our patients receiving 4 grams of avertin were somnolent for four and six hours after surgery.

HEXAMETHONIUM BROMIDE

This and pentamethonium bromide or iodide have been accepted fairly widely in England as a method of producing controlled hypotension during anesthesia. Its popularity can probably be attributed to the simplicity of administration, although in practice the results are not always all that might be expected. In certain subjects a satisfactory fall in blood pressure is not obtained even with large dosage. It is generally accepted that a blood pressure above 80 mm. Hg. systolic does not appreciably lower the amount of bleeding, and that ideally a pressure should be maintained somewhere between 60 and 75 mm. Hg.

The commonest use for the drug is in the management

of operations about the ear, face, thyroid, and breast. And since postural drainage of the operation site is as essential as the exhibition of the drug itself, its sphere of usefullness is somewhat limited. In most cases anesthesia is induced with Pentothal, sometimes curare, nitrous oxide, and oxygen, and the patient intubated. The patient is then postured so that the operation site is slightly above the rest of the body, and the hexamethonium bromide then administered intravenously. The dose to be used varies and it is difficult to give you anything more accurate than something of the order between 20 to 50 mg., this dose may be repeated as often as needed, though second and subsequent doses are usually much less than the initial one. It is also recognized that if curare is being used that a much smaller amount is needed to achieve the same result when a methonium compound has been administered. A blood pressure fall to the order of 60 to 80 mm. Hg. is to be expected within 3 or 4 minutes, and this usually is maintained for about ¾ hour, but may in certain cases last much longer. If a dangerous fall in blood pressure results, lowering the head of the table and the administration of Methedrine desoxyephedrine provide immediate, and nearly always, satisfactory responses.

The postulates of Gillies concerning the decrease in peripheral resistance and the lowered head of pressure applies to the use of this drug in the same way as to total spinal. The main danger of the method lies in asphyxia if a proper airway and adequate oxygen are not supervised, and permitting a dangerously low level of blood pressure to persist for a long period of time.

Our early experience emphasizes to us that the following prerequisites are absolutely essential in the proper conduct by patients with controlled hypotension by means of pharmacologic blockade of sympathetic ganglia with hexamethonium bromide: (1) A good airway, a good respiratory exchange and a high concentration of oxygen; (2) the presence of a large bore needle in a good vein permitting immediate increase in circulating fluid volume by intravenous fluids; (3) the availability in a syringe of an effective vasopressor drug such as desoxyephedrine should the patient develop a hypotensive crisis; and (4) the selection of patients presenting no major arteriosclerosis, heart, or kidney disease.

In addition to using this agent for production of controlled hypotension, we used it as a therapeutic agent to control hypertensive crises. An example: A 73-year-old well preserved male patient with a blood pressure of 140/90 was given a spinal anesthetic with 8 milligrams of Pontocaine and 5 percent dextrose for Prostatectomy. Simultaneously he was given an injection of 25 milligrams of ephedrine in the muscle. The blood pressure remained stable for more than an hour and then as the anesthesia started to wear off, the pressure rose to 290/160; the patient developed precordial pain and a throbbing headache. When these persisted for ten minutes, a test dose of 5 milligrams of Bistrium was injected to reduce the pressure to 260/140; five minutes later, an additional 5 milligrams of Bistrium promptly reduced the pressure to 130/80 where it remained for the next two hours.

There is a considerable danger that the surgeons may demand a bloodless field in cases in which such a refinement is unnecessary. The method will necessarily fall into disrepute when

these methods are forced on junior anesthetists who are not competent to manage such cases. Even though this method has achieved popularity it is still viewed with some suspicion. The use of the methonium compounds could not be regarded as a standard anesthetic procedure, although this is almost the case. These methods have been studied in the U. S. only during the past six months. We present this preliminary information as a progress report.

Note to Supervisors

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What the Surgeon Expects of an Operating Room Supervisor*

● Sir William Osler once said "There are individuals, doctors and nurses for example, whose very existence is a constant reminder of our frailties, and considering the notoriously irritating character of such people I often wonder that the world deals so gently with them."

In re-reading this quotation from a great clinician and teacher, I was rather appalled at my own audacity in accepting the assignment for discussion. It is expected that a surgeon will discuss surgical subjects of interest;

By Charles W. McLaughlin, Jr., M.D., Department of Surgery, University of Nebraska College of Medicine, Omaha

that he will be loath to discuss the attributes or shortcomings of a colleague is understandable, but to put down in words what he expects of his operating room supervisor for all to see, dissect, and criticize, is a hazardous undertaking. I turned to my colleagues for support since the weight of public opinion gives strength in a crisis. After analyzing the results of my inquiry, very fragmentary from some and voluble from others, I came up with this simple formula.

STRENGTH OF SAMSON

The surgeon expects his operating room supervisor to have the strength of Samson, the endurance of a distance runner, the judgment of Solomon, the discipline of a Marine sergeant, the executive ability of a campaign manager, the scientific fervor of a Pasteur, the fairness of his own mother, the patience of Job, and hopes that the product will look like a Powers' model.

Obviously the qualifications to be a successful operating room supervisor are many, and this no doubt explains why such personnel, when found, are so highly prized by the attending surgical staff.

In our modern hospitals all student nurses go through a period in the operating room, and it is this training given and the stimulation received that lights the desire in some to become surgical nurses and ultimately supervisors. Certainly it is not the number of cases on which the student scrubs during this period of time, but what she learns that should be stressed. Sound experience in the practice of rigid, aseptic technic, the ability to think and act promptly in an emergency, and the knack of cooperating as a team, are far greater assets to the nurse who wishes to specialize in operating room work than mere dexterity in handling instruments and sutures. Such a skill is largely mechanical and can be quickly acquired.

Mental alertness, physical strength, self-control and unfailing conscience, together with unlimited patience, must be characteristics of operating room nurses. These qualifications together with a sound knowledge of fundamental principles and the practice of faultless, aseptic technic and a keen sense of responsibility, usually meet the demands of the most exacting surgeon and open the way for advancement to Head Nurse. The work is exact-

**This article is based in part on certain passages in Eliason, Ferguson and Sholtis, Surgical Nursing. J. B. Lippincott Co., Philadelphia, 9th edition, 1950. By permission of publisher.*

ing, the hours long, and the nervous strain is great, but to the student nurse who aims high, there is much to be gained by striving to be a real operating room nurse.

All people are idealists in varying degree. During her training the student nurse is usually a bit in awe and perhaps even frightened at her new found responsibilities in the operating room. Here it is that the successful supervisor through tact, encouragement, patience, and precept can become an ideal and fulfill her highest responsibilities.

TEAMWORK IS NECESSARY

In the operating room more than in any other department of the hospital there must be co-ordinative and co-operative team work. Each member of the group must know her exact duties for which she is held responsible.

The head nurse or supervisor is in full charge, with her assistant or next in line in experience next in precedent, and so on to the most recent member of the team. There must never be any question as to who will give orders or who will receive them. If a senior nurse in the hospital is sent to the operating room and there is a younger nurse there with more operating room experience, the younger nurse with more experience functions as the senior.

Every member of an operating room group must work together so that the group of workers may function not as individuals but as a unit having one common interest, the welfare of the patient. The operating room supervisor can do much to arouse this spirit among her staff, but if she does not have their support and cooperation, her efforts alone cannot achieve the impossible. She it is who is responsible for everything, mistakes as well as good results. She may explain and outline various duties and procedures, but she must depend upon the conscientiousness and reliability of her staff for perfect execution.

THE DESPICABLE PERSON

One who cheats is a miserable person any time, but the nurse who will cheat in sterilizing time is one of the most despicable of characters. No matter if it be the most impressive of Chief Surgeons and his impatience knows no limits, never hurry sterilization. If an instrument falls on the floor, it must be resterilized the required length of time by the clock no matter who waits. To do otherwise might result in the loss of a patient's life.

Just as a naval captain at sea is responsible to higher authority for the acts of his entire crew, so the operating room supervisor must assume similar responsibility for her staff. That mistakes be minimized it is essential that the duties of everyone in the operating room be clearly outlined and set down, preferably typewritten. This avoids errors and fixes responsibility at all times. Lists should be posted where all can see. With such an arrangement more work will be accomplished in a given time, and if something is not done the Head Nurse knows at once where the fault lies.

EXPLAIN EACH STEP

Every efficient Head Nurse of the operating room should personally explain to each new nurse the different steps in water and autoclave sterilization. The same is true for the names and uses of instruments and other apparatus. When leisure time is available the Head Nurse should further instruct her staff on various technics and periodically quiz them on procedures at which they have assisted. From such exercises the younger nurse learns much, and the Head Nurse finds out how much actual knowledge the students and her assistants have beyond mere mechanical duties.

It is accepted that in this day of specialization, with an increasing graduate staff in the operating room, more and more departmentalization is appearing. Thus the actual instruction in general surgery may come from one group of graduate scrub nurses; in urology, plastic surgery, chest and neuro-surgery from another group. The over-all picture of training, however, remains the responsibility of the senior surgical supervisor who must see that the whole represents a well co-ordinated period of training.

All operating room nurses must be neat and clean in appearance at all times. Dirty or untidy operating room gowns have no place in surgery, and in this the supervisor must set the example. She should be informed if any of her staff have upper respiratory infections or sore throats, relieving them from duty if this seems desirable.

COOPERATION IS ESSENTIAL

If the surgical supervisor can manage her own staff efficiently, it is unusual for her to have any problems in her relations with the attending surgeons. Cooperation is essential for all members of a team, but it is both desirable and essential that she have the courage to say "no" or express disapproval on occasion. Favoritism breeds dissension and disrespect, and in such daily matters as the scheduling of cases all must be treated alike.

What then is the reward for service demanding so much? Certainly it must not be expected in a monetary way, nor is the authority accompanying such a position adequate compensation, for all authority carries with it like demands and responsibility. The real compensation for those who make our modern operating rooms possible is that of participating in a well-functioning team and daily assisting in the accomplishment of work for the relief of suffering patients. To many the excitement, the tension, and the challenge of the operating room offer real attraction. Here is therapy in action at its dramatic best, and as such it will always appeal to those who are willing to give freely of their time, their best efforts, and themselves.

A paper presented at the Mid-West Hospital Association meeting in Kansas City.

The Conductometer

● With the advent of new gases in the operating and obstetrical areas in hospitals, the danger of the combination of these gases with oxygen, to form an explosive mixture which can easily ignite, is being more seriously considered.

Only by constant vigilance can those responsible for safety in hospital operating and obstetrical areas insure that all possible is being done to guard against igniting an explosive mixture by a spark from static electricity. It is not enough to install conductive floors, conductive leg tips on operating room furniture, and explosion-proof fixtures. Nor is it enough that operating room personnel wear conductive footwear, and clothing best suited to prevent the building up of static electricity.

It is vital that flooring and operating room furniture and equipment be periodically tested electrically to insure that they meet and continue to meet the limits of resistance specified in NFPA Bulletin 56 for conductivity. It should be mandatory that personnel test themselves for personal conductivity, and insure that they do not exceed the limits of resistance set by NFPA Bulletin 56 each time they enter a hazardous hospital area where potentially explosive gases may be present.

In order to answer the problem of testing personal and equipment resistance in hazardous hospital spaces, the Conductive Hospital Accessories Corp. of Boston has developed a Conductometer* for this purpose. This instrument, commonly known as Conductometer Model 90-500, derives its name from the fact that it measures resistance at a steady voltage of not more than 500 volts. The source of supply of power to operate the instrument is obtained from normal lighting circuits of 115-120 volts and by means of transformer action voltage, stepped down or stepped up to required voltages.

Instrument is accessible for personnel testing

In a normal installation the instrument is flush mounted in the wall of the operating room (scrub room or operating room corridor) with the base of the instrument a minimum of five feet above the floor line. The reason for this is to have the instrument mounted above the five foot danger zone for explosive gas mixtures. With the instrument so mounted, it is accessible for both personnel testing, and

** Trade mark patent applied for.*

equipment and flooring testing. The two necessary power leads, and a lead to connect the instrument to a metal plate (or conductive flooring) for personnel testing, are lead through a conduit and secured to terminal posts in the back of the instrument, and are therefore hidden from sight.

For personnel testing the Conductometer is provided with an elbow switch. Personnel to be tested stand in front of the instrument on a metal plate, or on the conductive flooring which is in turn connected to the Conductometer. When the person standing in testing position touches the elbow switch, a 90 volt circuit is completed, and the person's resistance is directly read off on the graduated dial face.

The dial reading face of the Conductometer has been colored to easily determine and delineate the safety limits. From 0 to 25,000 ohms resistance there is no color. Between the limits 25,000-500,000 ohms to 1,000,000 ohms, the reading the dial is colored red. Therefore when personnel are tested, safe limits are shown by the green and yellow are as recommended by NFPA Bulletin 56. The green limitations delineate the recommended safe limits for conductive flooring and operating room equipment when tested in accordance with test methods of Section 6 of NFPA 56.

For flooring and equipment testing there is provided a 20' lead with two five pound electrodes made in accordance with recommendations in NFPA Bulletin 56. This lead is connected to the Conductometer by a four pronged plug connection which is inserted in the four pronged receptacle in the Conductometer when flooring and equipment are to be tested. This automatically furnishes the 500 volt circuit for floor and equipment testing in operating room areas. By means of the 20' lead the electrodes may

Two electrodes are used to test floors and equipment

be placed anywhere on the flooring or equipment, the resistance of the floor being measured at the prescribed three foot distance, and the equipment measured to insure that its resistance is low enough to allow a flow of electrical current to the floor. The depressing switch on the right hand side of the Conductometer is used to complete the "500 volt circuit" for flooring and equipment testing, and the resistance of the flooring or equipment is read directly on the face of the Conductometer.

Means are provided to calibrate the Conductometer, commonly called "zeroizing". This should be done before use in order to compensate for slight variations in voltage, and in order to obtain accurate readings.

The Conductometer provides the simplest, and most direct method of checking flooring, personnel, and equipment resistance to insure that any generated static electricity can be drained off with no ensuing spark.

job description *

o.r. staff nurse

JOB SUMMARY

Assists with various types of surgical operations and performs related services.

PERFORMANCE REQUIREMENTS

Responsibility for: Observing aseptic technics in preparing for and assisting with surgical procedures. Providing necessary instruments, supplies, and equipment for operations, according to hospital policy and routine of surgeon. Recognizing and interpreting symptoms indicative of changes in condition of patient.

Physical Demands: Physical and mental stamina to work rapidly and with accuracy over long periods, and to endure the strain and pace of operating-room activity. Finger and hand dexterity to manipulate instruments and equipment. Visual and aural acuity to detect changes in patient's condition. Walks and stands during the work day.

Special Demands: Willingness to work with realization that errors and incompetence may have serious consequences for patient. Ability to adapt self to various types of personalities. Cooperation with other members of operating team. Memory for details. Alertness and skill in identifying patient symptoms. Resourcefulness in emergency situations. Works under general supervision.

QUALIFICATIONS

Education: Graduation from an accredited school of nursing; registration with State board of nurse examiners; advanced preparation in operating-room nursing procedures, or its equivalent, is preferred.

Training and Experience: In-service training provided by many hospitals.

Job Knowledge: Knowledge of various steps of different operations to be able to anticipate surgeon's needs, and of each surgeon's technics. Correct method of handing instruments and supplies to surgeon. Thorough knowledge of medical asepsis as it applies to the operating room. Proper handling of tissue specimens, cultures, and smears. Good understanding of various instruments used for each type of operation and proper set-up of operating room. Thorough knowledge of general nursing theory and practices. Familiarity with organization and functions of all departments, and policies, regulations, and procedures of hospital. Working knowledge of literature and new developments in field of general and surgical nursing.

WORK PERFORMED

As scrub or sterile nurse: Dons cap and mask, and prepares for and dresses in sterile gown and rubber gloves. Sets up operating room with instruments and supplies which vary according to type of operation performed. Arranges instruments and other articles in specified order, placing those used immediately on portable table near surgeon. Anticipates surgeon's needs, such as

instruments, sponges, sutures, and suction tubes, and places them in his hands in such manner that surgeon need not divert attention from operative field. Observes patient during surgical procedures for complications, such as hemorrhage, and furnishes emergency equipment and supplies to prevent fatality. Manages contaminated materials during operation to prevent spread of infection.

As circulating nurse: Places patient in prescribed position to assure access to operative field, prevent interference with circulation or respiration, and protect nerves from undue pressure, adjusting operating table and accessory devices as required. Prepares operative area by sterilizing skin and draping patient (if not done by surgeon). Preserves and labels operative specimens for laboratory analysis. Provides special equipment such as cauteries, electrosurgical machines, and diagnostic lights, insuring that they are in working order, and manipulating such instruments to aid in efficiency of surgeon and avoid hazard to patient. Observes progress of surgery, providing additional instruments, supplies, or other items as needed. Provides, regulates, and inspects such fluids as blood, plasma, saline, and glucose, and cardiac and respiratory stimulants to prevent fatalities during surgical shock. Cooperates with members of operating staff in observing aseptic technics and sterilization procedures in preparing for and assisting with surgery. May apply dressings. Accompanies patient from operating room to recovery room.

Miscellaneous duties: Assists in orientation of new personnel by explaining and demonstrating technics and methods used in operating room. Cleans or directs cleaning and sterilizing of contaminated instruments, equipment, and supplies; resterilizing of unused sterile supplies; care and storage of delicate instruments; cleaning of contaminated operating-room areas; and care and disposal of infectious linen. Performs other duties as directed.

*** Excerpt from Job Descriptions and Organizational Analysis for Hospitals and Related Health Services.**

NEW PRODUCT

Conductive Rubber Slippers have been perfected and have been proven successful in protecting against static electricity sparks and consequent explosions in operating rooms. The slippers are patent pending. Inexpensive and adjustable, the slipper is quickly slipped over the regular shoe, and the one-piece conductive rubber sole comes over the heel of the shoe and back inside where it fits so snugly it cannot be felt. Contact with the wearer is established through sock or stocking, so that cotton hosiery is recommended. Four sizes fit all doctors, nurses and visitors. Tested by a leading independent laboratory, the conductive rubber slippers won approval for conductivity and aging, even after repeated sterilization by autoclaving or boiling. Melrose Hospital Uniform Co., Inc.

Development Program for the *O.R.S.*

By JERRY E. WALSH

● At the present time there seems to be a very acute shortage of well-trained Operating Room Supervisors. Frequently, while calling on hospitals, we are asked the question, "Where can I get a good Operating Room Supervisor?" This question provoked some thinking.

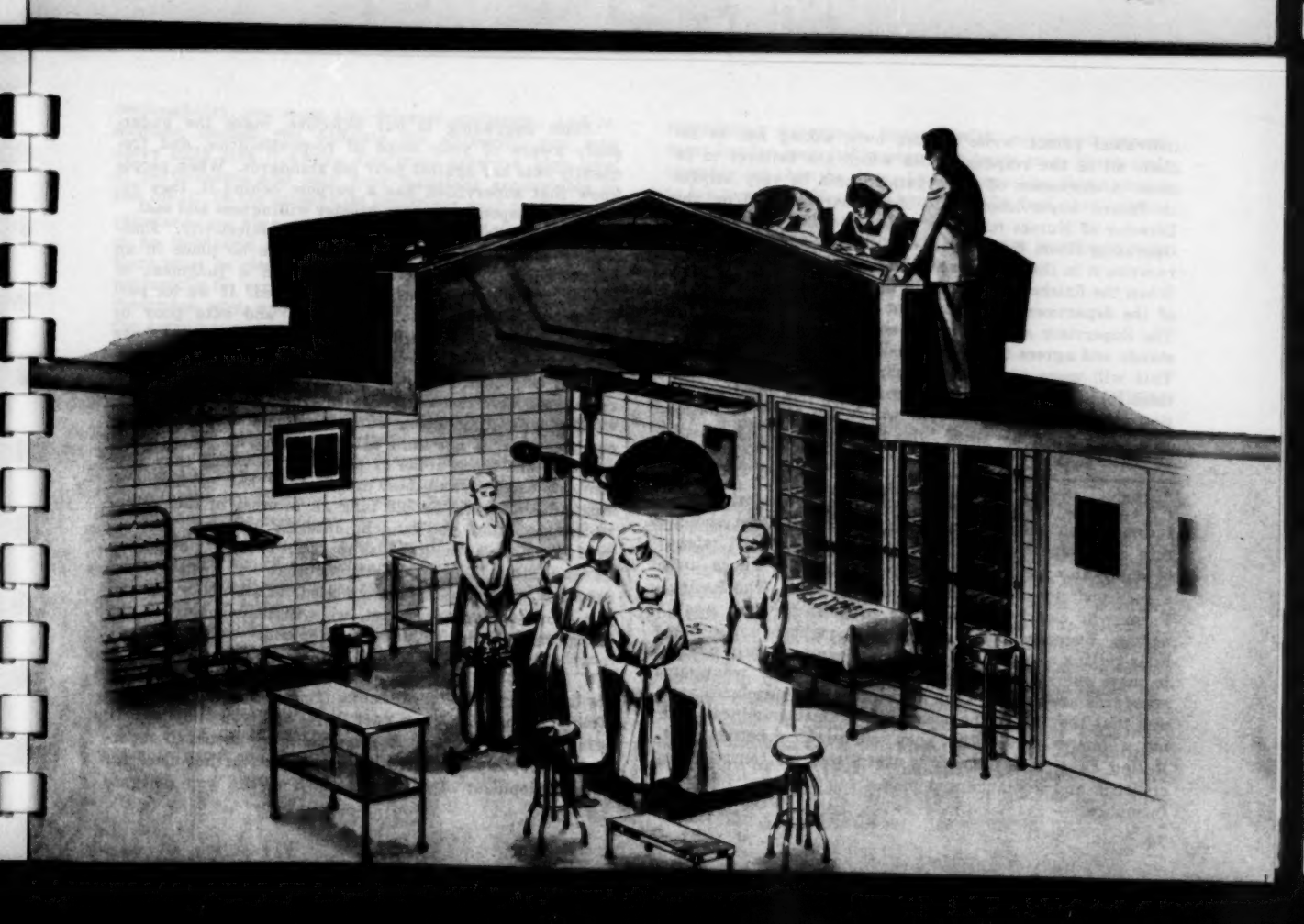
In industry it has long been a practice to organize a program for upgrading of personnel to fill the role of management. This is possible only when the correct viewpoint and attitude is arrived at on the part of the Operating Room Supervisor. Industry's thinking follows along these lines: Those in management should be basically competent. To the extent they are competent, they feel secure. Feeling secure, they do not fear anyone taking their jobs. In fact, they are hoping someone will in order to free them to take a better job. If we can use this basic philosophy as the motivating concept, how might we apply it in hospitals and in the nursing profession, and what benefits might we expect? I think it reasonable to assume it might accomplish the following:

1. Raise the standards of the Operating Room Supervisor's job to that of an Operating Room Administrator.
2. Fill a vital need for competently trained Operating Room Supervisors.
3. Assist in the over-all nurse recruitment program.
4. Make for better integration between the Nursing Department, Administration, the Operating Room, Central Supply, General Stores, and Admitting.
5. Improve patient care through improved efficiency and service.

How might we set about to accomplish these broad objectives? First and foremost, to do a job, we must know what the job is we are to do. Therefore, what more logical starting place than a written Job Description.

a. For the Operating Room Supervisor
b. For her Assistant (Development candidate)
c. For Head Nurses
d. For Graduate Nurses
e. For Student Nurses
f. For Nursing Aid Personnel
g. For Orderlies

The Job Description is vital. There are many ways of developing a good Job Description. One is to have the



individual person write up her own, asking her to include all of the responsibilities which she believes to be hers. A discussion of these duties would be very helpful in future supervision. The Administrator and/or the Director of Nurses might be enlisted to analyze, with the Operating Room Supervisor, each Job Description and to re-write it in the most concise and complete form possible. When the finished product is in the hands of each member of the department, a department meeting should be held. The Supervisor should then be sure that everyone understands and agrees to the responsibilities set forth therein. This will more easily be accomplished if we can make them realize they had a voice in making the Job Description. Supervising any job in which the scope of duties was contributed by those who must perform them will be much easier.

JOB RATING

A Job Rating Form, based on the Job Description performance, should then be made up. This Form should rate each aspect of job performance, e.g., a girl might be doing an exceptional job of setting up for a case, and a very poor job in cleaning up after a case. The Rating Form will clearly indicate her proficiencies and weaknesses. Everyone doing a job has a right to know how he is getting along on that job. How can we expect people to meet our standards when they don't know what our standards are? When they know what our standards are, and that they are being measured against standards and not whims of personality, they will perform better. The Rating Form then becomes a useful tool for constructive criticism and guidance and makes for improved job performance.

Since upgrading is our objective, make the understudy aware of your scope of responsibilities, and frequently rate her against your job standards. When people know that supervision has a purpose behind it, they respect and respond to it with greater willingness and zeal.

Rating calls for a high degree of objectivity. Emotion, personalities, and friendships have no place in an honest rating. The rating is as much a judgment of the rater, as it is of the one being rated. If we let personalities enter into our judgments and rate poor or good, and the job performance belies our rating, we have only fooled ourselves and demonstrated poor judgment. Having established the Job Description and performance rating, we have two vital keys to supervision.

The Operating Room Supervisor should counsel with each member of her staff after a rating has been made, pointing out those areas of the work in which they particularly excelled, and those areas where their performance was sub-standard. People take an interest in themselves when they know you take an interest in them. Interest in them implies a willingness to listen to their viewpoints. In counseling, adopt the attitude that will lead to free response by the one being counseled. If we make counseling a two-way conversation, we will learn many of the things that prompt actions—good or bad.

LEARNING IS ACTION

Learning is action. It comes from within and by doing. Telling a person, no matter how well you may tell it, seldom teaches very much. Specific assignments in supervision, properly delegated by you, are a starting place for the development of an understudy. When you delegate

responsibility, you must also delegate authority. And remember, though you delegate the authority, you may never fully give it away. You must expect a high level of performance and hold your Assistant accountable to you for it. To the extent that she knows your performance standards are high, so will she respond. Making mistakes is an inevitable consequence of learning. Your instructions must be clear and to the point to minimize the opportunities for error. When mistakes are made, you should determine why, and counsel at that time will accelerate the learning program. You must back up the authority you have vested in your Assistant, and follow the chain of command. You can ill afford to give an Assistant responsibilities and authority and then go over her head.

Going back to the part that attitude and viewpoint play in such a program, let us consider your job as you know it today. There is no doubt that time does not permit you to accomplish many of your objectives. The one common denominator that every living mortal possesses, whether he be president, king, doctor, or beggar, is that there are only 24 hours in a day. It is a utilization of these 24 hours with the proper motivation based on correct attitudes and viewpoints that makes one man a success and another a failure.

If we take the attitude, "Why should I train someone to take my job?", we'll not be very likely to do anything very constructive in developing an understudy. On the other hand, if we adopt the viewpoint that the sooner I have someone ready to step into my shoes, the sooner I will be ready to take a bigger job. At this point we begin to grow and to think as an Administrator.

Take your own hospital as an example. The wise Administrator surrounds himself with competent department heads—men and women who know more about their specific jobs than he does. Does he consider this a threat to his security? Not by a long shot. In fact, that is what makes his security.

In developing an understudy, there are four basic steps that must be taken:

1. Selection
2. Orientation
3. Job training
4. Supervision

SELECTION

In industry the person is hired for the job. Each job requires different talents, characteristics, abilities, and motivations.

If you have followed the suggestions of developing a Job Description, that can be helpful in giving you an insight into the type of person who must fill that job. If the Nursing Department, through the Director of Nurses, will give you the opportunity to have a voice in the girls selected for the Operating Room, you will develop a better nucleus from which to pick a trainee. In your selection, use the yardstick of the Job Description. Take into account the competence of the person and her attitude towards supervision and direction, because you cannot build on someone who has no desire to succeed.

An audit of existing nursing personnel, measured against the standards set forth in the Job Description, will point up the likely candidates for upgrading consideration. In considering a person for the role of under-

individual person write up her own, asking her to include all of the responsibilities which she believes to be hers. A discussion of these duties would be very helpful in future supervision. The Administrator and/or the Director of Nurses might be enlisted to analyze, with the Operating Room Supervisor, each Job Description and to re-write it in the most concise and complete form possible. When the finished product is in the hands of each member of the department, a department meeting should be held. The Supervisor should then be sure that everyone understands and agrees to the responsibilities set forth therein. This will more easily be accomplished if we can make them realize they had a voice in making the Job Description. Supervising any job in which the scope of duties was contributed by those who must perform them will be much easier.

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An audit of existing nursing personnel, measured against the standards set forth in the Job Description, will point up the likely candidates for upgrading consideration. In considering a person for the role of under-

study, in addition to the basic requirements of the Job Description, let's look into attitudes. How well does she get along with her fellow workers? Is she a trouble maker? Is she an easy mark? Does she have the poise and respect of all who work with her? How well does she measure up in these categories?

In addition to the attitudes, let's determine concretely:

1. Suitable motivation for the job. The applicant's need for, or interest in, this particular job. Will she work hard, or just go through the motions? If her incentives for the job are strong, she will stick to the job. If her desires are weak, her work will be weak. Furthermore, is her motivation temporary in nature? Is it easily satisfied, or is it wholesome? The degree of motivation should be carefully considered. Is it just enough, sufficient, weak, or apparently non-existent?
2. Qualifications of leadership. To manage others, we first must be able to manage ourselves. How well has the candidate demonstrated self-reliance? Is she a self-starter? Do others on her own level come to her for advice and guidance? Demonstrated leadership of this type is of the highest order. How much dependability has the candidate demonstrated? How much prodding has been necessary when assignments were given her? Does she accept the consequence of her actions? Is she basically truthful and straightforward, or does she pass the buck for her failures and mistakes?

These basic qualifications have been touched on before lightly. You can, I am sure, develop them to a much fuller extent than I have attempted to do here.

In selection, and again I am using the yardstick of the Job Description, the Operating Room Supervisor should seek permission from, and the cooperation of, the hospital Administrator and the Director of Nurses to give her a voice in choosing all Operating Room personnel, both nursing and non-professional.

When you have the authority to select people, you, yourself are being tested in the areas of judgment, analysis, imagination, etc. This will serve to develop and broaden your own scope of administrative ability.

As a guide in selecting, a rule that has proved rather sound through the years is: "The most reliable indication of what a person will do is an accurate knowledge of what he has done in the past." Such things as, was she pampered as a child, lazy at home or in school, etc., indicate a lazy habit has been developed and will follow in her work. Does she finish projects she starts?

INTERVIEWING

In recruiting, the interview is a very important factor. After the initial screening, when we settle down to those few from whom we are going to make our final selection, we should arrange to interview in private. There are basic requisites for good interviewing:

1. Put the candidate at ease. Make her as comfortable and as relaxed as possible.
2. Develop an objective viewpoint. All executives like to consider themselves as impartial judges of others, and with a little effort, can approach a fair-minded appraisal of personalities. There is, however, one big danger in interviewing, and that is the distortion of impressions, arising out of emotional likes

and dislikes. To be aware of this, we must recognize our own biases, opinions, and prejudices. For example, Mary dislikes people with Polish names, because ten years ago a girl with a Polish name stole her best boy friend. These emotional influences are part of our heritage. They warp our judgment, and unless we consciously try to neutralize our personal biases, we will hire the unqualified, and frequently reject those best qualified.

In interviewing it is equally important that you show no evidence of tension. For if you are tense, you will transmit it to the candidate and weaken your own effectiveness. Assume a polite, friendly, and businesslike attitude. The amount of time necessary in interviewing will depend on many factors: The number of candidates you see, the quality of the candidates, and the number of qualified candidates. A word of caution about haste. It is better to make no selection, than a poor selection.

The health of the person considered is very important. Has she the stamina for the job? How much time did she lose because of illness in the last year?

When interviewing, make a written record of your impressions. Verify these at a later time, and on a second interview, look for any of the doubtful notations you had made on your initial interview.

In recruiting personnel, careful screening will pay real dividends. The right people, with the right motivation and the correct attitudes, are the nucleus of building a sound department, and by so doing, you are building your own job to that of an Administrator.

ORIENTATION

Orientation is an adjustment period to new people, new work conditions, new technics, and new surroundings. It is a formative stage where direction is imperative. It is also an explanatory phase. You should clarify such things as: the policies of your hospital and your department, the working hours, pay day and method of payment, your training program, etc. It is a period of personal introduction to all members of the department, their names, titles, and responsibilities.

Since people can be expected to remember only so much in a given time, the orientation period should be spread over several weeks or months as indicated. The Supervisor should make up an orientation check list to include all the details of orientation. The list should be flexible enough to provide for the orientation assignments for the first day or week, the second week, third week, etc. This will assure the Supervisor that she has not overlooked anything. The list should include provisions for questions asked by the one being oriented. A duplicate copy of the check list may be given to the trainee which will serve to give her an over-all look at her job and her surroundings, and prompt her to accelerate her own program.

A review of the full scope of the Job Description, and a period of working with you as an observer, will help greatly. Weekly or semi-weekly conferences with the understudy, in which you review various actions and decisions which were made while she was observing, will help to accelerate her orientation program. Have her sit in on all meetings which you conduct. When the meeting has been adjourned, ask her to summarize it for you. In this way, you will be better equipped to counsel with her. Initial attitude on the job will prevail. Start her right. Job orientation can make or break the one being groomed.

The adage that "As the twig is bent, so the tree will grow", could well be our motto during this period. The attitude that we display will likely be the pattern she will follow.

JOB TRAINING

Job training reached great heights during the last World War. Accelerated learning was a must. Many short cuts were developed and many lessons were learned. Perhaps the biggest lesson learned in job training was to take nothing for granted. A simple example of this was fitting a nut to a bolt. Everyone assumed that everyone knew how to perform this operation. Weeks, or months, later many machines in industry had to be stopped and new nuts and bolts attached. It was found that placing the flat surface of the nut on the bolt first secured it much tighter than when the procedure was reversed. Thereafter, everyone was taught why and showed how. Result: Fewer machines required servicing because of failure of the nut and bolt assembly.

Most Operating Room Supervisors have developed and are using Procedure Manuals, covering the various surgical procedures—appendectomy, laparotomy, etc. These Procedure Manuals explain and visually show the kind and number of instruments, sutures, drapes, etc. being used. Visual prep charts serve as training aids.

Sterilizing procedure should be written and fully explained. The trainee may then be checked against known standards and has a ready reference at hand.

Weekly department meetings where procedures are discussed, then performed and criticized. make for effective training. There is no substitute for doing, and when a competent, trained instructor supervises, pointing out mistakes and explaining why, fewer mistakes will be made.

In the Operating Room where you are dealing with sterile procedure and where human life is generally at stake, anything less than a perfect job is a serious hazard. Here, too, the concept of right attitudes and viewpoints plays an important role. If there is a better way of doing something, even if it isn't our way, let's adopt it. It matters little who's right. It matters much what's right.

SUPERVISION

Supervision calls for a different set of talents and abilities than merely being a top-flight scrub nurse and head nurse. The human relations aspect of supervision cannot be overstressed. A good Supervisor must be able to inspire confidence in the people she supervises. She must have a reputation for personal integrity and fair play, and possess the ability to organize and execute action on team level. In short, she must possess qualities of leadership.

Good supervision might be likened to holding mercury in your hand. If you squeeze too tightly it gets away from you; you hold it loosely, and you keep it intact. If you have established the right procedures and developed effective controls, there is no trick to holding the mercury.

Briefly clarify your position to all your people. Make known your standards of performance. Make sure they understand and agree to them. Then see that they comply with them.

Establish free rapport and encourage questions and counsel. Be a good listener. Learn to develop the traits of leadership that inspire confidence and a following.

The concept of patient benefit prevailing in the Operating Room will accelerate a greater willingness and respect for better technics and methods of job performance. The written Job Description and the employment of specific training assignments, with properly delegated responsibility and authority, will do much to develop an understudy rapidly. If your selection was a good one, and your understudy has the right motivation and drive, if you work together, if you share common objectives, you can look for development and growth.

SUMMARY AND CONCLUSIONS

First, to raise the standards of the Operating Room Supervisor's job to that of an Administrator. If we have succeeded in convincing Administration to give us the authority to recruit, orient, train, and develop personnel for the job of Operating Room Supervisor, and if we have broadened our own scope of understanding to the point that we could achieve this, we have developed into administrative timber.

This program then successfully fills our second objective—filling the need for competent and trained Operating Room Supervisors.

Third, to aid in the over-all nurse recruitment program. Many girls graduating from high school and college today who possess executive motivation would be attracted to Operating Room nursing, because with this program they would be afforded an opportunity to attain their goals.

Fourth, those attaining the job of Operating Room Administrator will find themselves as department heads, sitting in on meetings with other department heads, and thus make for better integration of all hospital departments.

Last, through improved managerial know-how and better training, better patient care will result.

ABOUT THE AUTHOR

In preparing this article on a development program for the operating room supervisor, Jerry Walsh was able to draw heavily from the experience of his present position. As Northeastern Division Manager, Ethicon Suture Laboratories, Mr. Walsh's management is concerned with selection, orientation, job training, supervision, and manpower development. When the depression terminated his education after two years in medical school, Mr. Walsh immediately went into sales. For some time he was a sales agent for the National Cash Register Company. He joined Ethicon in 1943 and become manager, Metropolitan Division in 1945. He was promoted to his present position in 1950.

The Problem Clinic

by EDITH DEE HALL R.N.

● A regular monthly feature set aside for the discussion of administrative problems in the O.R.

Better Service Through Staff Conferences

● Better understanding and better service in the operating room can result from routine staff conferences. Supervisors in many hospitals have already discovered how valuable weekly, bi-weekly, or even monthly conferences can be.

In every hospital the obstacle which prevents establishment of this routine is lack of time. The difficulty is selecting a time convenient for all to attend. It seems unfair to expect nurses to sacrifice off-duty hours for this purpose, yet many hospitals do.

The most advantageous time is the first hour of the day. This necessitates starting the operating schedule an hour later on the appointed day. You will find that surgeons will cooperate with such a plan if they are informed of the meeting's purpose and are made to realize that meetings are for the good of the operating room service and the surgeons themselves will benefit.

Discussion material will be plentiful. Special assignments and duties of auxiliary workers can be analyzed. Changes in procedures may be recommended and explained. For example: it may be called to the attention of the group that a sterile pack lacks an item that would be useful. This may be countered by another nurse pointing out that the same pack may then be too large or too heavy to meet sterilization recommendations. Mistakes made and repeated because of an oversight or lack of time for investigation can be corrected during a staff conference.

The surgeon is conscious of the actual technic carried on in the operating room. He, as well as his nurse, is

constantly alert for a break in technic, accidental or otherwise. This same surgeon, however, trusts the supervisor and her staff to prepare all supplies in the best possible manner. It is the supervisor's responsibility to see that correct procedures are carried out.

Not all of our hospitals can afford new and modern equipment, but do we nurses make the most of what we have? A conscientious effort can be made to secure new and better equipment. Although this task is often discouraging, we should never be content to accept things as they are. Staff conferences offer opportunity for each nurse to help in this program.

To stimulate interest of nurses in the staff meeting, give each a definite assignment for each meeting. Ask each nurse to report on a pertinent subject. A discussion such as approved recommendations on the use of the surgical mask—how it should be worn, how often it should be changed, material used and care given as to laundering and sterilizing will often bring to light surprising information. Individual participation increases the nurse's desire to read and become familiar with what is new.

By all means, invite students to attend at least one of the conferences.

Use Bulletin Boards to Disperse Information

● Bulletin boards placed in convenient, frequently passed areas are an important method of dispensing information.

A bulletin board for student and graduate staff nurses should include time, on call, and student class schedules; notice of lectures nurses may attend; detail or assignment sheets; new rules; changes in routine; invitations and notices of special activities; and notices of ANA, A.O.R.N., and alumni meetings. Keep the board up-to-date and use colored cards to attract attention to new and important information.

A bulletin board for auxiliary workers will give them a specific place to find their duties posted. Their time, relief, and meal schedules should be included. Clear, detailed schedules eliminate a great deal of misunderstanding often prevailing in these groups.

Problems

Q. *I am an operating room supervisor in a hospital where operations are scheduled outside of the department. Late in the afternoon, the schedule for the following day is sent to my desk. Can you suggest how I may have this duty assigned to me and designated members of my staff? We feel that under the present system we cannot plan efficiently.*

A. Appeal to have this matter presented at a surgeons' staff meeting. Prepare a written statement of existing conditions and your reasons for wanting them changed. Surely no one is better prepared for this task than those who actually work in the department. Surgeons should realize that nurses become discouraged when schedules are overcrowded and badly managed. Since most schedules are controlled by rules and regulations set up by the surgeons, you are not asking too much to be given the thankless job of booking their cases.

Q. *Nurses on night call have reported that operations are being done that are not emergencies. They do not mean*

the occasional case where a mistake in diagnosis was made, but cases brought in as emergencies because of lack of space on the schedule for the following day. Can you suggest a solution?

A. This practice is unfair and dishonest and is one more reason why nurses become over-tired and resign. No one objects to being called for a real emergency, but nurses and physicians do resent being imposed upon unnecessarily. This matter should be presented to those in authority. The anesthesiologist and others who have been called out should be able to support the cause for complaint. The facts, and they should be correct, should be written down and presented to the proper people. Immediate action should be taken before others follow the same practice and before a good nurse resigns.

Camp Rucker's O. R. Supervisor Designs Instrument Rack

● The operating room at U. S. Army Hospital at Camp Rucker, Ala., has an instrument rack for storing surgical instruments which materially simplifies the old method and cuts in half the time consumed in the selection of instruments. It was designed by the operating room supervisor, Capt. Julia B. Tamer, Army Nurse Corps.

The instrument rack measures about five by two and a half feet and consists of five small racks. It is used in a standard chrome instrument cabinet and can be modified for use in any type cabinet which has removable shelves.

Camp Rucker mechanics constructed the steel rack with a strong base, removed the shelves, and slid the rack into the cabinet.

The rack allows orderly distribution of ringed instruments which are arranged in designated order on the supporting rods according to types and use.

Capt. Tamer was recalled to active duty in June, 1951. During World War II, she served for more than four years with the Army Nurse Corps, with all but eight months of the time spent in British West Africa with the 57th Station Hospital and in Europe where she was assigned to the 100th Evacuation Hospital.

Receiving her early training at Mount Vernon Hospital, New York, Capt. Tamer later did post-graduate work at Michael Reese Hospital, Chicago, and the Peter Bent Brigham Hospital, Boston. For more than three years, she served as operating room supervisor, Memorial Hospital, Worchester, Mass.

NEW PRODUCT

New O.R. Mask, made from a pre-shrunk, double-ply bleached cloth withstands repeated laundering with less than one percent shrinkage and easily outwears the ordinary gauze mask. It is constructed to fit the contours of the face, and equipped with a metal nose strip to prevent fogging of glasses. Samples on request. Johnson & Johnson.

Local and Regional Anesthesia for Minor Surgery

By John Adriani, M.D.
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BRACHIAL PLEXUS BLOCK.

There are a number of simple blocks which can be used for minor surgery. One of the most widely used nerve blocks is the brachial plexus block. The brachial plexus block is designed to produce anesthesia of the arm and forearm. It is accomplished by infiltration of the trunks, divisions or cords of the plexus with a local anesthetic solution. A number of technics have been described. In general we recognize two types of brachial blocks: (1) the supraclavicular type, and (2) the axillary type. The supraclavicular blocks are fraught with certain hazards, notably pneumothorax and trauma to great vessels, which remove them from the realm of simple procedures.

One Point Supraclavicular Block. The most popular supraclavicular block is the so-called one point block. It is performed by placing the patient in the supine position and arranging the arm on the side to be injected in slight abduction. The head is rotated in the opposite direction. The operator stands on the side to be injected. The landmarks are (1) a point midway and 1 cm. above the superior border of the clavicle (Fig. 456). The midpoint of the clavicle is obtained by bisecting the distance between the acromioclavicular and the sternoclavicular joints. (2) The lateral border of the subclavian artery above the clavicle and (3) the external jugular vein are identified. The vein passes downward and medial to the midpoint of the clavicle. An intradermal wheal is raised 1 cm. above the midpoint of the clavicle and a 5 cm. needle unattached to a syringe is introduced through the wheal, exercising care to avoid the artery and the vein. The mar-

ker is set for 1.5 cm. and the needle is advanced posteriorly, caudad and medially at an angle of approximately 60 degrees until the first rib is encountered. Care must be taken not to advance the needle any farther than the marker if the rib is not encountered. Withdraw the needle 2 or 3 mm. after the rib is encountered so that it lies in the same fascial compartment as the brachial plexus, that lies superficial to the deep fascia of the neck. Place a drop of anesthetic solution on the open end of the hub of needle and ask the patient to take a deep breath. This is to determine whether or not the pleura has been pierced. There should be no movement of the drop. Inject 25 cc. of 2 percent procaine, or equivalent volume of solution of other drug. Perform aspiration frequently during the injection. Anesthesia will be complete in the hand, fingers, and forearm within 10 to 15 minutes. No anesthesia results in the axilla because the nerve trunks there are large and the drug does not penetrate easily. The patient is usually able to use the fingers and thumb. When lidocaine or tetracaine is used motor paralysis is obtained. The block is suitable when procaine is used in the repair of tendons, or similar operations, where it is desirable not to completely abolish motor effects.

Axillary Route. When the axillary route is used the patient is placed in the supine position. The arm is abducted at 90 degrees and allowed to rest on a support in external rotation. Any axillary hair is shaved and the patient is surgically prepared and draped. The humeral insertions of the latissimus dorsi posteriorly and pectoralis major anteriorly are palpated. A vertical line is drawn

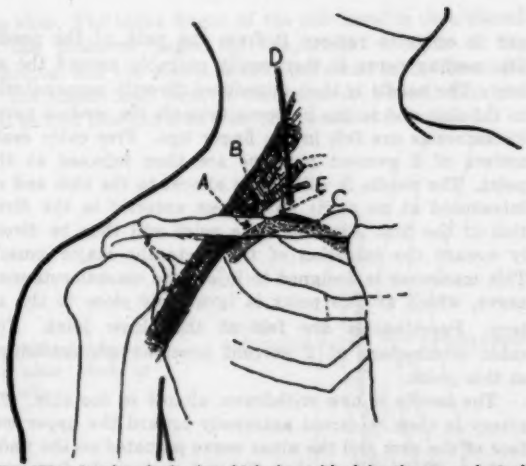


Fig. 456. Landmarks for brachial plexus block by the supraclavicular route. A, Midpoint of the clavicle. B, Site of injection. C, Subclavian artery. D, External jugular vein. E, First Rib.

between these two points. This line is then bisected and the point marked. This point lies directly over the brachial artery, which may be palpated in all except extremely obese subjects. A wheal is raised at this point using 2 percent procaine or other desired solution. A ¾ inch 25-gauge needle attached to a 10 cc. syringe is suitable for thin subjects. For muscular and obese individuals a 1 or 1¼ inch 25-gauge needle is desirable. The artery is palpated and retracted posteriorly with the thumb and index fin-

ger in order to remove it from the path of the needle. The median nerve is then easily palpable around the artery. The needle is then introduced directly perpendicular to the skin and to the humerus towards the median nerve. Paresthesias are felt in the finger tips. Five cubic centimeters of 2 percent procaine are then injected at this point. The needle is withdrawn almost to the skin and reintroduced at an angle 45 degrees anterior to the direction of the first injection. The point will thus be directly toward the insertion of the pectoralis major muscle. This maneuver is designed to inject the musculocutaneous nerve, which at this point is invariably close to the artery. Paresthesias are felt at the elbow joint. Five cubic centimeters of 2 percent procaine are introduced at this point.

The needle is now withdrawn almost to the skin. The artery is then retracted anteriorly toward the upper surface of the arm and the ulnar nerve palpated on the under surface. The needle is then directed posteriorly downward at an angle of 45 degrees to the plane of the original injection for the median nerve. Paresthesias corresponding to the distribution of the ulnar nerve to the fourth and fifth digits are felt. Five cubic centimeters of 2 percent procaine are injected at this site. The radial nerve is then blocked. The radial nerve is the least accessible element of the plexus at this site because it is deepest and is posterior to the artery and, therefore, not palpable. The median and ulnar nerves are easily palpable. The needle is once again withdrawn almost to the skin and the artery still retracted upward, and the needle is reintroduced at an angle almost 90 degrees to the plane of the injection for the median nerve. Paresthesias corresponding to the distribution of the radial nerve along the back of the hand must be felt. Failure to obtain paresthesias is usually followed by failure to obtain anesthesia in the dorsum of the hand; 5 cc. of 2 percent procaine are injected at this site. The syringe should remain attached to the needle throughout all maneuvers. It is absolutely imperative that the needle be at a right angle to the shaft of the humerus at all times and not inclined to angulate it in any way toward the axilla or down the arm so that it tends to parallel the humerus, muscles, and nerves. Aspiration before each injection must be attempted. The injection site is massaged gently for five minutes.

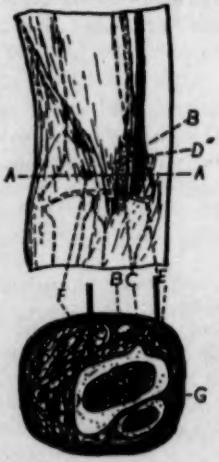


Fig. 458. Landmarks for median and radial nerve block at the elbow; A-A, Line above crease of elbow. B, Tendon of biceps. C, Brachial artery. D, Vein. E, Median nerve. F, Radial nerve beneath brachioradialis muscle. G, Ulnar nerve.

THE MEDIAN NERVE BLOCK AT THE ELBOW. The median nerve may be blocked either at the elbow or at the wrist. When block at the elbow is attempted the landmarks are the brachial artery, the tendon of the biceps, and the internal condyle of the humerus. The patient is placed in the supine position with the arm abducted and forearm extended. An applicator moistened with iodine or ink is placed in the cubital fossa. The forearm is then flexed on the arm to make an angle of 90 degrees. A transverse line results (Fig. 458). The tendon of the biceps may be felt by flexing and extending the forearm with the hand in supination. The brachial artery may be palpated medial to the tendon. An intradermal wheal is raised medial to the artery and a 5 cm. needle is introduced through the wheal perpendicular to the skin through the superficial and deep fascia. Paresthesias are sought. Three cubic centimeters of 2 percent procaine are injected at this site. Two or three cubic centimeters more are injected in fanwise manner over the path of the nerve. A garter may be circumscribed intracutaneously and subcutaneously with procaine above the site of injection in order to block nerves which anastomose with the median from the upper arm.

RADIAL NERVE BLOCK AT THE ELBOW. The radial nerve may also be blocked at the elbow and at the wrist. When block at the elbow is attempted the same transverse line is used as for block of the median nerve. The position of the patient is the same as for median nerve block. An intradermal wheal is raised 1 cm. lateral to the tendon of the biceps on this line (Fig. 458). A 5 cm. needle is introduced through the wheal perpendicular to the skin. The index finger of the left hand is then placed at the posterior aspect of the lateral condyle of the humerus, and the needle is then advanced in the direction of the finger until bone is encountered. Paresthesias are felt at this site and 2 to 5 cc. of procaine are injected.

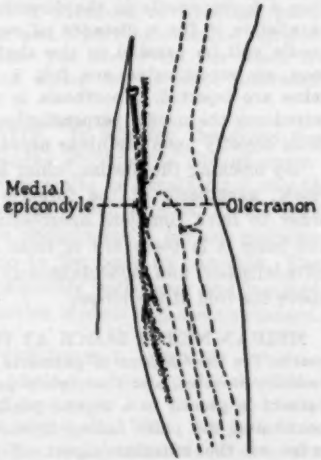


Fig. 459. Landmarks for ulnar block at the elbow.

ULNAR NERVE BLOCK AT THE ELBOW. Ulnar nerve block may be done at the elbow or at the wrist. The landmarks are the groove between the internal condyle of the humerus and the olecranon process. The patient is placed in the lateral prone position on the side opposite the one to be injected. The arm is allowed to rest alongside

the body. The nerve is palpated and grasped above the groove, using the thumb and index finger of the left hand. An intradermal wheal is raised on the tip of the fold of the skin thus grasped. The wheal should be 3 cm. above the bony prominence, as shown in Fig. 459. Introduce a 5 cm. needle in the direction of the nerve, nearly parallel to it for a distance of several centimeters. The needle will be parallel to the shaft of the humerus. As soon as paresthesias are felt 5 cc. of 2 percent procaine are injected. Anesthesia is not obtained when one introduces the needle perpendicular to the skin and comes down directly upon the ulnar nerve.

By blocking the median, ulnar and radial nerves at the elbow, anesthesia of the forearm may be obtained. In order to have complete anesthesia of both the forearm and hand it is necessary to raise a circumscribed garter intradermally and subcutaneously about 1 or 2 inches above the fold of the elbow.

MEDIAN NERVE BLOCK AT THE WRIST. The landmarks are the tendons of palmaris longus and flexor carpi radialis muscles, and the styloid process of the ulna. The patient is placed in a supine position with the arm on a board and the palm facing upward. Locate and mark a cross on the anterior aspect of the wrist through the styloid of the ulna. Locate and mark the outline of the palmaris longus and flexor carpi palmaris and radialis tendons. Raise an intradermal wheal between the first two of the above tendons on transverse line through the styloid of the ulna and introduce a 5 cm. needle perpendicular to the skin through the superficial and deep fascia and advance it 0.5 cm. beyond the deep fascia (Fig. 460).

Inject 2 cc. of 2 percent procaine at this site. The needle is then partly withdrawn and inclined towards the flexor carpi radialis tendon, and introduced approximately 0.5 cm. deep to the tendon; 2 cc. of 2 percent procaine are then injected at this site and followed by gentle massage.

ULNAR NERVE BLOCK AT THE WRIST. The landmarks are the same as for the median nerve block at the wrist, except that the tendon of the flexor carpi ulnaris muscle is used. The patient is in the same position with the hand in supination. Palpate the tendon of the flexor carpi ulnaris at the level of the styloid and raise an in-

Fig. 460. Landmarks for median and radial nerve block at the wrist. A-A, Transverse line through ulnar styloid for determining point of injection. B, Flexor carpi radialis longus tendon. C, Palmaris longus tendon. D, Flexor carpi ulnaris tendon. E, Ulnar artery. F, Ulnar nerve. G, Median nerve. H, Radial artery.

tradermal wheal on the radial side of the tendon of the flexor carpi ulnaris on the line through the ulnar styloid (Fig. 460). Introduce a 5 cm. needle perpendicular to the skin and pierce the deep fascia. Seek paresthesias, and when those are felt inject 3 cc. of 2 percent procaine.

RADIAL NERVE BLOCK AT THE WRIST. The lateral branch of the radial nerve is anesthetized by locating the anatomical snuffbox, making the tendons prominent, and injecting 3 cc. of 2 percent procaine through a wheal raised at this site. The medial branch is blocked by infiltration of the subcutaneous tissues around the wrist.

BLOCK OF THE THUMB AND FINGERS. For minor surgical procedures the fingers may be blocked, although in most instances it may be desirable to block the nerves at the wrist, elbow, or do a brachial plexus block for

Fig. 461. Block of thumb and fingers. Intradermal wheals are raised at points A and B which are located at midpoint on each side of the metacarpal bone of the digit to be anesthetized.

hand surgery. The patient is placed in the supine position with the dorsum of the hand placed upward. The metacarpal bones are palpated. An intradermal wheal is raised on each side of the midpoint of the metacarpal bone of the digit to be anesthetized, or all the digits if desired. A 5 cm. needle is advanced towards the palm perpendicular to the skin and 1 percent procaine injected as the needle is advanced. The area from the wheal to the web of the finger on either side is then infiltrated (Fig. 461).

BLOCK OF THE DIGITS. In blocking the digits the landmarks are the phalanges proximal to site of operation. The dorsum of the finger to be anesthetized should face upward. An intradermal wheal is raised on the dorsum of the digit over the phalanx and 1 percent procaine injected through the skin to the bone on one side. The needle then is almost completely withdrawn and inserted on the other side, and injection is made in the same manner.

BLOCK OF THE INTERCOSTAL NERVES. The intercostal nerves may be blocked as they course the intercostal spaces. The usual landmarks are the mid-axillary line and inferior border of the rib. With the patient in the upright sitting position and hands folded over the head to allow ample exposure of the thorax, intradermal wheals are raised over the lower border of the desired ribs in the midaxillary line. Five centimeter needles are then introduced through the wheals until contact is made with the lower border of the rib. The skin and soft tissues in the region of the puncture are then retracted downward with the thumb of the right hand (Fig. 462). The needles

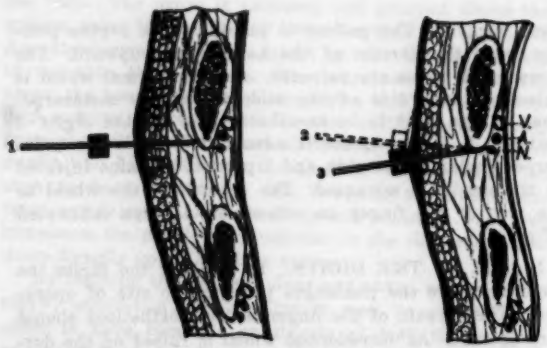


Fig. 462. Technic for blocking intercostal nerves. The relationship of vein, artery and nerve are shown.

are then inserted 0.25 to 0.5 cm. beyond the lower border of the rib. Paresthesias are usually felt if the needle encounters a nerve. Five cubic centimeters of 2 percent procaine are injected at this site. It may be necessary to infiltrate the skin and subcutaneous tissues in the midaxillary line with 1 percent procaine to block the nerve filaments which leave the nerve posterior to the site of the block. It must be remembered that the intercostal nerve accompanies the artery and vein in the intercostal groove along the inferior border of the rib. The nerve is inferior to the artery. The vein is superior to both nerve and artery.

LATERAL FEMORAL CUTANEOUS NERVE BLOCK. This nerve block may be used in superficial operations on the lateral aspect of the thigh, such as skin grafts and removal of tumors. The landmarks are the anterior superior iliac spine and the inguinal ligament. The patient is placed in the supine position. An intradermal wheal is raised 1 cm. caudad and medial to the anterior superior iliac spine, and an 8 cm. needle is introduced vertically through this wheal and advanced until the iliac bone is

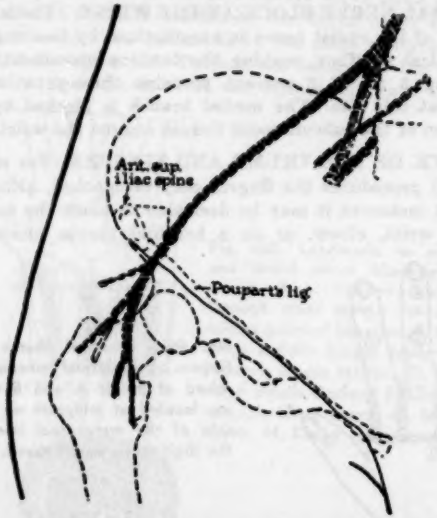


Fig. 463. Lateral femoral cutaneous nerve block. Black dot is site of wheal medial and caudad to anterior superior iliac spine.

encountered (Fig. 463). Ten cubic centimeters of 1 percent procaine are injected. The needle is then withdrawn almost to the skin, and injections, using an additional 10 cc. of solution, are performed in a fanwise manner in the lateral medial direction over an area of 4 or 5 cm. along the spine of the ilium.

FEMORAL NERVE BLOCK. The femoral nerves may be blocked below the inguinal ligaments. This block may be used for operations on the anterior medial aspect of the thigh. Landmarks are the inguinal ligaments and the femoral artery. The patient is placed in the supine position. The inguinal ligament is identified, the femoral artery palpated, and then retracted medially during the injection. An intradermal wheal is raised just below the inguinal ligament lateral to the artery (Fig. 464) and an 8 cm. needle is introduced through the wheal perpendicular to the skin until the iliac fascia has been pierced. The marker is adjusted to 1 cm. as soon as the needle has passed the fascia and inserted 1 cm. beyond the fascia. Paresthesias will usually be felt. Five cubic centimeters of 2 percent procaine are injected. If no paresthesias are elicited, it may be necessary to inject 25 cc. of procaine in a fanwise manner in a perpendicular direction beneath the fascia and into the muscle.

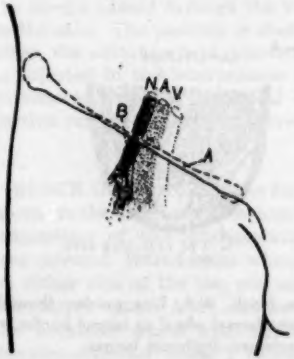


Fig. 464. Femoral nerve block. A, Inguinal ligament. B, Site of wheal over nerve lateral to artery beneath ligament.

SCIATIC NERVE BLOCK. Sciatic nerve block may be performed by locating the posterior superior iliac spine and the greater trochanter of the femur. A line is drawn between these points and bisected. At this midpoint a line is drawn perpendicular to the iliotrochanteric line in a caudad direction for a distance of 3 cm. A wheal is raised at this point. A 10 cm. needle with a marker set for 6 to 7 cm. is then introduced perpendicular to the skin through the wheal. Paresthesias will be felt on the posterior aspect of the leg and in the heel. Ten to 15 cubic centimeters of 2 percent procaine are injected. Ordinarily 2 percent procaine does not give satisfactory results, and in certain instances as much as 4 percent may be needed to secure paresis and complete sensory anesthesia. This block may be used for fractures of and operations on the foot or lateral aspects of the legs.

POSTERIOR TIBIAL NERVE BLOCK. The anterior and posterior tibial nerve blocks may be used for operations on the foot. These nerves may be blocked at the ankle. The landmarks for posterior tibial nerve block are the Achilles

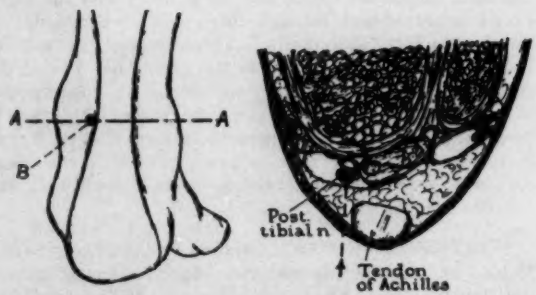


Fig. 465. Posterior tibial nerve block. A-A, Line passing through base of internal malleolus. B, Site of wheal medial to border of tendon of Achilles.

tendon and the internal malleolus of the tibia. Flex and cross the leg to be blocked over the other. Locate the base of the internal malleolus and circumscribe a line around the ankle which passes through this base. The Achilles tendon is then palpated and the medial border marked and an intradermal wheal raised on the circumscribed line at the medial border of the tendon (Fig. 465). The needle is then introduced through the wheal and advanced perpendicular to the skin towards the tibia. As the needle passes through the deep fascia and fat pad beneath the tendon, continue to advance the needle until the second layer of fascia is pierced. Paresthesias are felt as the needle advances beyond this point. Five cubic centimeters of 1 percent procaine are injected at this site.

ANTERIOR TIBIAL NERVE BLOCK. This block, when employed in conjunction with the posterior tibial block, gives satisfactory anesthesia for operations on the foot. The landmarks are the internal malleolus and tendon of the tibialis anticus muscle. The patient is placed in the supine position with the leg flexed so that the sole of the foot rests upon the table. A line is circumscribed about the ankle which passes through the base of the internal malleolus, in the same manner as for the posterior tibial block. An intradermal wheal is raised on a line lateral to the tendon of the tibialis anticus muscle (Fig. 466). The needle is connected to the syringe and introduced through the wheal until it encounters the tibia. It is then withdrawn about

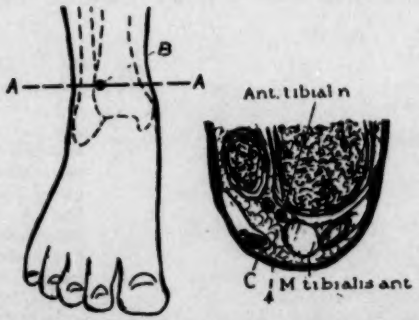


Fig. 466. Anterior tibial nerve block. A-A, Line passing through internal malleolus. B, Site of intradermal wheal at lateral border of tibialis anticus. C, Tendon of extensor digitorum longus.

2 mm. and 5 cc. of 1 percent procaine solution is injected into this area. The needle is then partly withdrawn and inserted in a lateral direction between the extensor hallucis and extensor digitorum longus tendons until the tibia is encountered. A 1 percent procaine solution is injected at this point.

BLOCK OF THE GREAT TOE. The landmarks are the metatarsal bone of the great toe and the web between the second toe. An intradermal wheal is raised at the dorsomedial border of the foot alongside the first metatarsal bone and at the web of the great toe and border of the metatarsal of the great toe (Fig. 467). An 8 cm. needle is attached to a syringe containing 1 percent procaine and the needle passed through the wheal in a direction normal to the skin. The position is then changed to an oblique one when the skin has been pierced and 0.5 percent procaine is injected in the interosseous space. The needle is then introduced through the wheal over the web and the injection repeated again in a fanwise direction.

BLOCK OF THE TOES. As for the great toe, the webs adjacent to the selected toe or toes are used, and the proximal extremities of the inter-metatarsal space of the toe or toes selected. Intradermal wheals are raised for each web on either side of the toe, and one at the extremity of each intertarsal space. A 10 cm. needle is introduced through the proximal wheal and injections are performed in a fanwise direction using 1 percent procaine. The needle is

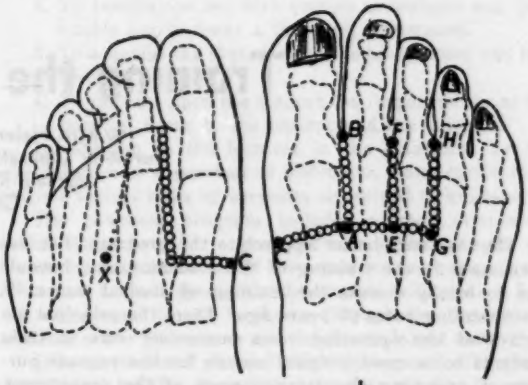


Fig. 467. Landmarks for block of toes. a. Plantar surface. b, Dorsum of foot. C, B and A are sites for raising wheals to block great toe. X, Point towards which needle is directed beneath metatarsal bone. B, F, H, G and E are sites used for raising wheals to block other toes.

then inclined toward the median sagital plane of the metatarsal bone and 2 or 8 cc. of the solution are injected on the plantar surface of the metatarsal bone. This should be done through both distal wheals.

Illustrations on pages 62-66 are from "Techniques and Procedures of Anesthesia" by Adriani, Publisher, Charles C. Thomas, Springfield, Ill.

Training the Student Nurse

By Mrs. Helen Dimschultz, R.N.
Formerly Operating Room Supervisor
Michael Reese Hospital
Chicago

● That we may better appreciate the progress that has been made in the training of the student nurse, I would like to briefly discuss the training of student nurses in the operating room 25 years ago. Then, the principal objective of the operating room supervisor was to train students to be good surgical nurses for the express purpose of executing the detailed work of the department. She was dependent on the students. In most operating rooms, the staff consisted of the supervisor and one or two graduates (excluding, of course, the departments in very large hospitals) and student nurses. In many instances the first assistant was the senior student. Likewise, auxiliary help was rare. The student nurse assumed responsibilities now delegated to graduates, and performed menial tasks now assumed by maids and orderlies.

Great emphasis was placed on developing good scrub nurses, capable of handling the most difficult cases. The outstanding student with native capacities for surgery received excellent experience and guidance, for it was to the supervisor's advantage to bring out the very best in this nurse. The student who was slow to adjust to the complex organization of the operating room and lacked the qualities so necessary for this specialty was tolerated, berated, and undoubtedly aggravated, and the supervisor bemoaned the fact that her department's efficiency was suffering due to poor student material. Very little thought was given to the loss suffered by the student who could not develop into a good surgical nurse. In three months she learned little more than folding sponges, washing gloves, and cleaning furniture. The student left the operating room with very little knowledge of aseptic technic and the principles of surgery that are invaluable to her future nursing career.

The teaching program consisted of the required 10 or 12 hours of classroom lectures and demonstrations. The emphasis was placed on aseptic technic in relation to the operating room and the qualities of a good surgical nurse. Generally speaking, little consideration was given the importance of surgery in relation to the student's entire nursing experience.

As a rule, the program included very little planned teaching in the operating room. Much of the knowledge

was gained from other students or by observation.

Today, the picture is quite different. The supervisor is still determined to have an efficiently managed operating room, but as a conscientious member of the faculty of a school of nursing she will not exploit the student nurse to maintain that efficiency. I do not mean to imply that the character of the supervisor has changed, but nursing standards and objectives have. Much credit for the progress made in the last 25 years should be attributed to the grading and curriculum committees set up to study standards by the National League of Nursing Education.

We find the departments staffed with more graduate nurses, and the auxiliary worker has been added to do the many housekeeping and routine duties, unimportant to the educational program, and very important to the smooth functioning of the department.

The supervisor realizes her responsibilities to the student nurse. She has as her objectives:

1. To give every student a sound, well rounded program of theory and planned practical experience.
2. To offer the student principles of aseptic technic adaptable to all nursing experiences as well as the procedures followed only in the operating room.
3. To integrate the student's contribution with the entire staff to insure efficiency, harmony, and conscientious service to the patient and the surgeon.

The teaching program

The classroom lectures are designed:

1. To develop the student's appreciation of aseptic technic.
2. To familiarize her with routine procedures and thus enable her to make a thorough adjustment.
3. To acquaint the student with the background and history of surgery.
4. To impress upon the student the responsibility of the surgical nurse to the patient and the surgeon.

In addition to the lectures in the classroom by the operating room supervisor or instructor, many curriculums include special talks by surgeons or trained technicians.

The practical program includes a good orientation which might be given a group of new students in the department, or one student if the rotations are quite spaced. This time is well spent, for the student will make a better adjustment if she is shown through the department and has minor procedures and details explained early.

Other methods of planned teaching are used. The group conference in the operating room at regular intervals is an excellent teaching medium, for it is more flexible than the classroom. Here the unusual operations, new technics, articles from periodicals or pamphlets may be discussed, as well as procedures and individual students' problems.

The conference is held with the individual student to discuss her progress and offer constructive criticism. Impromptu group conferences are called whenever a teaching stimulus presents itself.

The practical teaching program is constant and includes the patient teaching of scrubbing, circulating, caring for patients in the preparatory rooms, etc. The executing of the technical procedures requires close supervision, much reteaching and guidance. Not only does this make the experience more enjoyable and interesting to

the student, but the supervisor or a qualified assistant may observe her objectively and evaluate her qualities. By closely supervising the young nurse and reteaching, guiding, and counseling, the rigid methods so necessary to good operating room management can better be maintained.

The modern operating room includes good reference material available to all nurses:

1. The procedure book which should contain all procedures and routines.
2. A book or card file of individual surgeons' needs.
3. Textbooks adaptable to surgery.

A word about records . . .

The supervisor keeps accurate records of each student's experiences in all phases of the work.

Impartial, honest grading of each student once a month evaluates her progress.

DEVELOPMENT OF INDIVIDUAL TYPES

1. The outstanding nurse with a definite native capacity for surgery should receive additional responsibility and encouragement. These are the future operating room supervisors, assistants, instructors, etc.
2. The student less adaptable, but with potentialities which can be developed, needs guidance and patient help from the supervisor.
3. The student nurse who lacks the capacities or potentialities of surgery, and if unguided will "mark time" to complete an unpleasant experience, can be a real challenge to the supervisor. With help she can make a lesser contribution and gain fundamental knowledge.

NEW PRODUCT

Elastic adhesive is used in many hospitals for securing post-operative dressings, abdominal supports, umbilical hernias, bed sores, dislocations, and mastitis. Elastikon adhesive tape offers many advantages over rigid type tape from the standpoint of patient comfort and reduction of adhesive tape irritations.

Training Auxiliary Personnel

By Edith Chambers, R.N.
Instructor-Supervisor, Auxiliary Personnel
Wesley Memorial Hospital
Chicago

● Three years ago Wesley Memorial Hospital established a program to employ and train men and women as auxiliary nursing personnel. The classifications used at Wesley are junior orderlies, senior orderlies, ward helpers, and nurse aides.

During this period the contributions to the nursing service made by these employees have been very apparent to the faculty, staff nurses, and student nurses.

Most important, the duties performed by the auxiliary personnel have contributed to the comfort and welfare of every patient at Wesley.

The training program was started in June 1949, under the direction and guidance of a supervisor instructor. A faculty committee of the Department of Nursing governs the policies and procedures of this activity.

The program consists of two courses of instruction: (1) a basic course of 40 hours followed by a period of orientation, and (2) an advanced course of 50 hours of classroom instruction taken concurrently with the regular work assignments.

Men completing the basic training course are classified as junior orderlies, and the women as ward helpers. The junior orderlies and ward helpers assist in caring for patients by performing the following duties:

1. Make beds
2. Give oral hygiene
3. Prepare patients for meals
4. Wash patient's face and hands
5. Feed helpless patients
6. Handle trays
7. Wash pitchers and drinking glasses
8. Serve fresh water
9. Serve nourishments
10. Take patients to x-ray, basal metabolism, clinics, etc.
11. Collect urine specimens
12. Answer light signals
13. Clean and sterilize utensils
14. Take care of rubber gloves
15. Clean flower room
16. Defrost refrigerators
17. Refill toilet trays
18. Check bedside stands and supply with equipment
19. Keep utility rooms clean and supplied

20. Prepare patients for sleep

The advanced course of instruction was established to stimulate more interest in the opportunities offered to the auxiliary nursing personnel, and also to permit the assignment of additional duties. All junior orderlies and ward helpers are eligible to take the advanced course after having worked three to four months during which they have demonstrated their reliability.

After satisfactory completion of the advanced course the junior orderly is eligible to be advanced to the classification of senior orderly, and the ward helper to nurse aide.

The advanced course of instruction for the orderlies and nurse aides prepares them for assignments to the following duties:

1. Complete and partial bed baths
2. Tub baths and sitz baths
3. Special mouth care
4. Assisting with admitting, discharging, and transferring patients
5. Filling ice caps, hot water bottles, ice cellars
6. Taking temperatures, pulse, and respirations
7. Shampoo (bed)
8. Enema
9. Back massage
10. Application of restraints
11. Application of binders

12. Prevention of pressure sores.

As a result of establishing the senior level of auxiliary nursing personnel with its compensating increased rate of pay, Wesley has been able to attract more auxiliary personnel to accept evening and night duty. This is proving to be of increasing benefit to the professional and student nurses on evening and night duty.

The program becomes accelerated during the summer months when a limited number of high school and college girls are trained to cover vacation periods. The hospital expects these temporary employees to work a minimum of eight weeks. It is not uncommon for some of these girls to become so attracted to the nursing profession that they apply for enrollment in a school of nursing.

With Northwestern University's Medical School located just across the street from Wesley, a number of medical students are attracted each summer for part-time or full-time employment as orderlies. Some of the students continue after vacation to serve as orderlies on part-time evening duty throughout the school year.

Wesley maintains the team concept of assignments. The members of these teams who are non-professional work under the direction and guidance of the professional nurses. The non-professional or auxiliary nursing personnel are particularly helpful to the professional staff in aiding with the care of the convalescent and chronically ill patients.

Question Box

Each month questions pertaining to O.R. problems and technics will be answered by Dr. Carl W. Walter, nationally known for his operating room technic courses and as the author of "Aseptic Treatment of Wounds" (MacMillan). Questions should be addressed care of the O.R. Editor, Hospital Topics.

Q. For the past month we have been having quite a bit of wound infections after surgery. For our skin preparation we use Ether, Alcohol 70% and Tr. Zephiran, however the alcohol we use is rubbing alcohol. I'm just wondering if this skin preparation that we use would have anything to do with these infections. We use pHisoderm for scrubbing hoods before surgery. We also boil our instruments before using (30 minutes). Our Surgeon does not like to use autoclaved instruments. We use cotton for closure. It is also boiled for 30 minutes. I have done everything that I could to prevent these infections. I use diack controls, I've had my autoclaved checked. It's in perfect condition.

Now I'm wondering if it would be a good idea to have the operating room cultured, to see if there is anything that may be the cause of these infections. I am also wondering if there is any suggestion you may be able to give me on the skin preparation, that may be better than what we are using. Personally I don't think the infection is coming from my department, but I do want to be sure and to do everything in my power to prevent these infections. I also boil my brushes after use and place them in a 1:1000 solution of mercury cyanide.

A. Boiling water sterilizers have no place in a modern operating room and should not be used where steam is available. I suggest you review Chapter 6 of "Aseptic Treatment of Wounds" for a description of the fallacies of boiling water sterilization.

Ether should not be used for skin preparations. It has no germicidal properties and is an explosion hazard. Whenever possible, the patient should be instructed to scrub his skin for 5 days before operation with any of the soaps or detergents containing hexachlorphene, G-11. At operation, the area is lathered with pHisoderm with G-11; the lather is shaved off with a sterile straight razor. The skin is then scrubbed with 1-1000 aqueous Zephiran alternated with 40% isopropyl alcohol. Six sets of scrubs are used. An alternate technic is to clean and shave the area as described above and then flood the area with 2% aqueous iodine. Let it stand for a minute and then remove the excess with 40% isopropyl alcohol.

I suggest you use a good nylon bristle brush and

sterilize it in saturated steam at 250° F. for 30 minutes after use. You need not soak them unless you particularly want to but if you do, mercury cyanide is hardly a germicide of choice. I would suggest you use an aqueous solution of any of the quaternary ammonium compounds—Zephiran, Phemerol, etc.

Q. Wish to confirm a matter in relation to the use of Aqueous Zephiran. Did I understand that Zephiran (Aqueous) may be used in the hand basin in which the Surgeons rinse their gloved hands off during the operation? I mentioned this to one of our Surgeons and he said he would think that Aqueous Zephiran might irritate some tissues.

A. Aqueous solutions of Zephiran are not toxic to tissues and 1-5000 aqueous Zephiran is a suitable solution to be used for rinsing gloves during an operation. Indeed, several drops of Zephiran solution can be instilled in the conjunctival sac without causing symptoms or injection. You will find the toxicity studies made on Zephiran described in an article in Surgery, Gynecology and Obstetrics 67:683; 1938, "The use of a mixture of coconut oil derivatives as a bactericide in the operating room."

Q. Our E.N.T. specialists now use a telescoping lamp with a goose-neck and a head mirror. The switch is removed from the lamp and the plug is connected to an electric outlet with a locking device. This is 5½ feet from the floor. Even with these precautions, the District Engineer will not pass this light. We understand the A. S. Aloe Company carries a Prometheus Focalite—75 watt lamp. The telescoping tube stand and lamp are chrome plated and set in a heavy non-tipping base with a heavy goose-neck support lamp. Could you tell me whether the underwriters will pass this? If not, would you know of any piece of equipment now on the market which we could substitute?

A. The only portable equipment which should be bought for the operating room is that which bears the Underwriters' Laboratory seal of approval. Otherwise, you are likely to get into difficulty with the local inspection authorities. I regret that I am not familiar with the device you describe and cannot express an opinion.

Q. We have been separating our abdominal tape sponges from the rest of our laundry and have boiled them right in the operating room. We felt that the green dye from the linens would be absorbed in the sponges and make them unsafe for use. Can you tell us whether we could safely include them with the other laundry supplies or whether we should continue with our present practice?

A. I believe that you can launder your "abdominal tapes" with the remainder of the hospital laundry without danger to the patient.

Q. Should visitors to the operating room be gowned when there is no observation amphitheatre?

A. They should change all their clothing and walk in their stocking feet which will ground them, keep street dirt out of the operating room and encourage them to go home early.

Q. *What type of emergency lighting do you recommend for use in case of power failure?*

A. A motor generator set of sufficient capacity to provide standby service to the essential areas in the hospital.

Q. *What is a "drag chain"?*

A. A drag chain is a length of 45-pound bronze sash chain fastened to diagonally opposite legs of all portable operating room furniture which is not equipped with conductive castors. It is intended to provide a conductive path between equipment and the floor. It should be placed 3" high on the leg and should make good contact with the floor without creating a trip hazard.

Q. *We would be most appreciative of any information you may be able to give us on the research you may have done on cellophane tubing relative to its penetrability by steam and the mechanics of its use for this purpose.*

A. I believe you will find the cellophane tube method a satisfactory way of packaging catheters providing the lumen of the catheter is freshly rinsed with distilled water and the end of the tube through which the catheter is to be withdrawn is folded over and secured. The opposite end is folded and secured following exposure to saturated steam. Whem catheters packaged as described are exposed for 15 minutes at 250° F., this packaging technic is satisfactory. As long as the catheters are stored in a clean moisture-free place, they maintain their sterility.

Q. *We have no form of air conditioning, and in this hot weather it becomes rather uncomfortable in surgery. It has been suggested that an electric fan be installed in the top of the surgery, which is composed partially of glass. Would this circulate the dust enough to cause contamination of the sterile field, or would it just expel the heat?*

A. An electric fan is a very poor device in the operating room because it circulates dust and increases the likelihood of air-borne contamination. The ideal solution is to install a small air-conditioning unit in the operating room. This can be done safely at a level five feet above the floor, using an ordinary domestic package unit. This type of equipment costs roughly $300, and it should not be a burden in a hospital such as yours.

Q. *After rubber gloves have been autoclaved, how long will they remain sterile if put up in dry sterile cloth packs? Our current procedure is to re-autoclave them after ten days whether they are used or not.*

A. Properly packaged, properly sterilized gloves will remain sterile indefinitely if they are stored in a vermin-free, clean, dry place.

Q. *What procedure would you recommend for sterilization of cystoscopes and woven ureteral catheters?*

A. Cystoscopes can be disinfected in an aqueous solution of any of the quarternary ammonium compounds, such as Zephiran, Urolicide, or Detergicide. Woven ureteral catheters which are made of nylon can be sterilized in the steam sterilizer at 250° F. for 30 minutes. If they are made of a non-heat stable material, they can be soaked in any of the above-mentioned germicides. The

exposure time is 18 hours. They should be free of dirt, grease, and oil before they are placed in the solutions. Be sure that the lumen of the catheter is filled with the disinfecting solution.

Q. What are the advantages of using colored linens in the operating room?

A. Colored linen is used in the operating room because it contributes to the comfort and efficiency of the operating team. Colors which absorb light and reflect little of it, permitting maximum illumination of the operative field without causing constriction of the pupils and easy fatigue of the eyes, should be used. You will find directions for dyeing linen on page 123 of "Aseptic Treatment of Wounds." You can also obtain directions for dyeing linen from the Hospital Bureau of Standards, 247 Park Avenue, New York City.

Q. What is the proper procedure for sterilization of rubber gloves by autoclave?

A. Rubber gloves should be hydrated before sterilizing, and wrapped in hydrated textiles. This can be done by spraying the packaged gloves just before placing them in the sterilizer. They can be sterilized in saturated steam at 250° F. for 30 minutes. They should be allowed to dry for 48 hours before being used because rubber imbibes water and loses its tensile strength and elasticity. When the gloves dry out, their strength and elasticity are regained.

NEW PRODUCT

Every basic operating position anticipated by new operating table. Easily controlled within a height range of 27 inches through 45 inches—the short surgeon can now operate without resorting to a footstool. Completely head-end controlled. On the left, for Trendelenburg with gear indicator dial, only 20 turns of the crank-handle provides 45 degrees of Trendelenburg or reverse Trendelenburg. On the right, the crank-handle used in conjunction with the position selector lever articulates table top to selected position of Foot, Flex, Side and Back, eliminating trial and error during operation even though table movements are obscured by drape sheets. American Sterilizer Co.

Sterilizing Tubing

by Edith Dee Hall, R.N.

● Many nurses will welcome and find various uses for cellophane sterilizing tubing. Although the packaging and sterilizing of supplies is very often done by auxiliary workers, the procedures are taught and supervised by nurses. With the shortage of personnel a common problem in hospitals, efficient methods which facilitate an economy of time and labor, are most valuable.

Catheters have created a particular problem because of their expense, the large variety, and the special care necessitated in their use. Today it is possible to obtain x-ray and non x-ray ureteral catheters, bougies, uretheral catheters, and many other articles which may be autoclaved for the urology department. By autoclaving catheters in cellophane sterilizing tubing, a safer, convenient method replaces the old and very often uncertain procedures. The perforated paper tongue which holds the catheter also serves as a means of removing it without contamination. The size of the catheter may be written in a small box on this paper and this number can be easily read through the cellophane. If desired the date may also be entered.

With catheters properly packaged, autoclaved, and stored it is possible to have a complete supply on hand. Since the tubing is transparent a surgeon may see and select the type he wishes without contaminating other packages. Catheters should be autoclaved in a wire basket for 15 minutes at 250° and 15 pounds pressure. Although it is difficult to tear the cellophane, packages should be inspected for a break or puncture. As is the case with all sterile supplies, these packages should be handled as little as possible and stored in a clean dry cabinet away from traffic. With this care they will remain sterile for at least a month. Bacteriologists have proven that the tubing is impermeable to bacteria. Catheters were tested and found to be sterile after being stored for several months.

Above: Cellophane tubing is convenient for packaging and sterilizing syringes and needles. The plunger and barrel of the syringe as well as the needle are placed in separately. Above, left: Autoclaving catheters in the tubing is a safer, more convenient method than old procedures. The paper tongue which holds the catheter also serves as a means of removing it without contamination. Left: The syringe and needle can be assembled within the tubing before it is opened for use.

Another convenient use for cellophane tubing is the packaging and sterilizing of syringes and needles. The narrow tubing may be used for 2 and 5 cc syringes and the wider for 10 and 20 cc sizes. A special small paper to hold the needle is available. This paper protects the needle against dulling and provides a space where the gauge and length may be written. The plunger and barrel of the syringe as well as the needle are placed in the tubing separately. They too should be autoclaved for 15 minutes at 250° and 15 pounds pressure and stored in the same manner as the catheters. After autoclaving the syringe and needle may be assembled within the tubing before it is opened for use. This measure is most convenient and prevents contamination in handling.

Cellophane tubing will be found useful for small sets of instruments such as an incision and drainage or small dissecting set. It is also convenient for special equipment where it is desirable to see the size and type, as is the case with tracheotomy tubes, canulae, and many other small articles. Physicians should find it of special value in their small offices.

It is recommended that the tubing not be used more than once, and it should never be sterilized in a dry heat oven.

International College of Surgeons' Meeting

Lung Removal Aids in Treating Tuberculosis

Capt. Clifford F. Storey (M.C.) USN, Chief, Surgical Service, and Lt. Bruce F. Rothmann, (M.C.) USNR, Resident in Thoracic Surgery, U.S. Naval Hospital, St. Albans, L. I., N. Y.—Segmental resection of the lung in treating tuberculosis is a method of great promise. Results of an operation performed on 87 patients between April 1948 and July 1952, showed that of the 59 discharged patients, 38 are gainfully employed, and 16 are clinically well and apparently able to work. Ability to return to productive employment and to a useful place in society is one of the tests of efficiency of any method used in treatment.

Three were readmitted with a positive sputum and one has developed a heart condition. Work status of one was not ascertained, but he has a negative sputum and is clinically well.

Twenty-five remain in the hospital following the policy of six months' bed rest after operation. All are clinically well and have a negative sputum.

Although insufficient time has elapsed for final assessment of results, we are convinced that in selected patients segmental resection is superior to any other form of management. This applies particularly to small localized lesion cavernous or nodular, which is confined to a single segment, or to a patient in whom the primary focus occupies a segment and no more than one additional adjacent segment is involved.

It is not a cure-all applicable to all types of tuberculous pulmonary lesions. Consultations should be considered tentative and subject to modification by the results of more prolonged follow-up studies.

Funnel Chest Can be Corrected

Peter E. Rees-Davies, M.D., Vancouver, B.C.; Surgeon, St. Paul's Hospital—Funnel chest should be corrected by a simple operation when the child is one or two years old. The condition occurs in about one in 16,000 persons and in the ratio of four males to one female. Treatment is correction of the deformity by surgery to restore normal function.

Up to two or three years of age, the deformity is mobile and has not yet become permanent, nor has it caused any symptoms. The indication for operation then is to prevent the deformity from becoming permanent. Its correction in a child presents a simpler problem than in the older patient whose malformed chest has become permanently ossified.

In infants up to about two years of age, the procedure involves an excision or division of cartilage. In older pa-

tients, bone and cartilage grafts may be required as well. The postoperative course is usually uneventful and the patient goes home in about eight days.

Pancreatitis is Being Treated Successfully

James H. O'Neil, M.D., Kansas City; Surgical Staff, General, St. Mary's, and St. Margaret's Hospitals—Although the cause of acute pancreatitis has not been proven definitely, there is agreement that most cases are due to the action of trypsin upon pancreatic tissues.

Many of the cases have irregular symptoms and findings, and diagnosis often depends on the level of the amylase in the blood serum.

Treatment consists in minimizing pancreatic secretion with continuous gastric suction and drugs such as atropine or banthine, adequate fluids and electrolytes intravenously, transfusions of blood or plasma and the antibiotics to prevent secondary infection.

New Operation for Cancer of Esophagus

Edgar F. Berman, M.D., Baltimore; Adjunct Surgeon, Mt. Sinai Hospital, and Assistant Surgeon, Lutheran, St. Agnes, and Franklin Square Hospitals—With this technic, a section of the diseased esophagus is removed and replaced by a specially prepared polyethylene plastic tube, varying in length from four to nine inches. This may remain permanently or be removed after being completely surrounded by a fibrous sheath which forms in 60 days.

Thirty patients have undergone the operation in the last two years. Of these, 28 had malignancies, with 95 percent of these having regional extension of the disease at operation.

A contrasting analysis of results of these 28 cases and those done by usual methods reveals that the mortality is considerably decreased, the morbidity negligible, and the comfort of the patient tremendously improved by this method.

Operating time of the last 15 patients was reduced to under one and a half hours. Patients were up on the third or fourth day and discharged on about the 14th day. The operating mortality was under ten percent. Postoperative complications were minimal.

Technic to Rehabilitate Recurrent Hernias

William M. McMillan, M.D., Chicago; Associate in Surgery, Northwestern University Medical School, Professor of Surgery, Cook County Graduate School of Medicine and Senior Attending Surgeon, Wesley Memorial Hospital; and Robert T. McElvenny, M.D., Chicago; Assistant Professor, Northwestern University Medical School and Consulting Orthopedic Surgeon, Wesley Memorial Hospital—A new surgical approach for repair of recurrent direct inguinal hernias may help rehabilitate patients who after several futile operations are discouraged and unable to work.

This procedure employs a flap consisting of bone and its tough fibrous membrane, taken from the pubic region. The flap (2 x 1½ inches) is attached to the endoabdominal fascia. It is not a foreign body, but a living anatomical structure.

This technic has been carried out at Cook County Hospital. It is too early to evaluate accurately the end re-

sults. We feel this represents a logical approach to this problem as it has a firm anatomical basis and makes use of structures which are always adequate in strength. The technic is recommended in cases of recurrent hernia where orthodox methods hold out little hope of cure.

Ear Reconstruction with Frozen Semilunar Knee Cartilage

Leslie H. Backus, M.D., Buffalo, N. Y.—An ear, presentable and satisfying to the patient, can be built in a limited number of operative procedures.

At the time of an amputation or surgery on the knee joint, individual jars are supplied to receive the semilunar cartilages. Cartilages are placed directly in deep freeze at -40° C. Cultures are taken weekly, and cartilages are ready for use after four negative cultures (Wilson).

These natural-shaped cartilages seem to provide elasticity and flexibility better than that of costal hyaline cartilages.

Semilunar fibro-cartilages deep frozen caused minimal reaction. When placed under an anterior auricular skin thinned sufficiently in a small pocket, an auricle is created that is softer and more flexible and normal-feeling.

Reconstruction Surgery of Leg Wounds

S. Baron Hardy, M.D., Houston, Tex.; Associate Professor of Clinical Surgery, Baylor University College of Medicine—The "cross-leg flap graft" is used mostly in cases where a scar interferes with the function of the deeper structures or is adherent to bone. In the operation a piece of skin large enough to cover a damaged area is lifted from the healthy leg, but one end is left attached to its original site to provide a blood supply. The loose end of the skin flap is then sutured in place over the damaged area on the other leg and both are immobilized until the piece of skin has grown into its new position. The end of the flap is then detached from the original site.

Surgery involving bone, nerve, and tendon repair cannot be accomplished successfully through dense scars because results of such deep surgery depend on surface healing, which can be assured only by covering with pedicle graft.

Here a covering of skin and subcutaneous tissue furnishes a suitable covering for nerves and tendon preparatory to their subsequent repair. If bone grafting is contemplated, the scar must be removed and healthy tissue supplied preparatory to grafting.

Surgery Aids Portal Hypertension Patients

Philip Thorek, M.D., Chicago: Associate Clinical Professor, University of Illinois College of Medicine, Associate Professor, Cook County Graduate School of Medicine and Co-Surgeon-in-Chief, American Hospital—Recent advances in treatment for portal hypertension have produced a new lease on life for many suffering from this condition.

The blood flow block is most commonly within the liver and due to cirrhosis of the liver. A considerable part of the blood flow is blocked from entering the hepatic veins and is shunted back into the portal vein, thus increasing the blood flow through collateral, or secondary channels.

A block occurring outside the liver may be caused by

closing the portal vein or its main tributaries of fibrous or scar tissue. The increased pressure forces blood into the veins at the lower part of the esophagus, causing it to enlarge. These may rupture easily, leading to fatal bleeding from massive hemorrhage.

It is imperative to institute early and adequate treatment. Surgical treatment involves an anastomosis between the portal vein and another vein. This shunting of the portal flow directly into the system venous circulation reduces the blood flow through the collateral venous channels in the esophagus and at the same time lowers the portal venous pressure.

Curare Used in Polio Treatment

Victor Raisman, M.D., and Julius Schneiderman, M.D., Queens General Hospital, Jamaica, N. Y.—The use of curare in treating poliomyelitis relaxes the muscles, causing temporary partial or complete paralysis. This complete paralysis enables the polio patient to undergo stretching exercises of damaged muscles beyond the point considered normal, without experiencing excessive pain.

This report covers 136 patients with acute and subacute poliomyelitis treated between 1936-48. With few exceptions, the series excluded patients who had required treatment in a respirator or who had primarily bulbar involvement. Injections were given three times daily until normal muscle length had been restored. Curare was stopped but stretchings continued.

The study demonstrated that although paralysis cannot be prevented, maximum improvement is facilitated because with vigorous and continued stretching the following results are obtained: (1) Normal muscle length is retained; (2) fixed deformities are prevented; (3) no obstacle to recovery of power by weak muscles exists; (4) casts and braces are unnecessary; (5) circulatory disturbances are rarely encountered, and (6) limb length inequality is apparently rare.

A follow-up survey two to six years later demonstrated that stretching must be continued indefinitely. Otherwise, tightness or shortening returns, preventing weak muscles from improving and permitting contractures or even deformities to develop.

Question Box

Each month questions pertaining to O.R. problems and technics will be answered by Dr. Carl W. Walter, nationally known for his operating room technic courses and as the author of "Aseptic Treatment of Wounds" (MacMillan). Questions should be addressed care of the O.R. Editor, Hospital Topics.

Q. What is a wetting agent?

A. Wetting agents are a class of materials which when added to water make water wetter. The water is changed to the point where it wets everything. Most of the modern detergents in the laundry have traces of wetting agents added to them so that woolens and nylons are actually wet by the water and accordingly become clean much more readily. A wetting agent is exactly what the name suggests. Wetting agents added to germicides enable them to contact and destroy bacteria more quickly.

Q. Can tablets of procaine be used for making a procaine solution?

A. The binding material present in some tablets gives a murky solution. Pyrex glassware for containers, the use of 0.001N hydrochloric acid for the solvent will prevent decomposition and a yellow solution.

Q. Do you feel face masks should be worn over the nose as well as mouth in the O.R.? What kind of face mask do you advise? How often do you feel face masks should be changed?

A. Masks should be worn over the nose as well as the mouth since many bacteria may be expelled from the nose. The following rules will give the optimum control over contamination from expired air.

1. **Masks should be changed as often as possible. Their effectiveness decreases rapidly after they have been worn several minutes.**
2. **Masks should fit the face snugly so that the air is forced to filter through the mask.**
3. **For maximum efficiency, forced expiration should be avoided. Talking, sighing, laughing, sneezing, coughing all deposit bacteria on the masks which subsequently contaminate the air expired during normal breathing.**
4. **New masks should be laundered before use to mat the fibers and increase their filtering efficiency.**
5. **Personnel with colds should be kept out of the operating room.**

(Continued on next page)

Q. In high-pressure sterilizers (270°F), is it necessary to open the instruments?

A. All instruments in steam, boiling water, or chemical sterilizers should be unlocked so that there are no tightly apposed surfaces to prevent contact with the sterilizing medium.

Q. What is the best system of sterilizing ureteral x-ray catheters?

A. X-ray catheters made of nylon can be sterilized in saturated steam at 250°F. for 30 minutes. Catheters made of non heat-stable material, can be sterilized by exposure to any of the aqueous solutions of quaternary ammonium compounds for 18 hours. Be sure that the lumen is flushed through and left with some of the sterilizing solution in place.

Q. If carrying forceps are soaked in Zephiran; knife blades in Bard-Parker solution and suture tubes in Davis and Geck solution, is there danger in mixing these solutions by drippings from one jar to the other?

A. It would be much simpler to standardize on one solution for use in these three containers in the operating room. With the present technic, there is no hazard involved in carrying residual solution on the forceps from one container to another.

Q. If a doctor uses wet towels to drape around the incision, is this safe? All the drapes under the area are wet by the end of the operation.

A. If the towels are wet in a germicide and placed on clean, disinfected skin, there is little chance of contamination of the field. The hazard of wet drapes in the operating room is in placing a sterile sheet or towel on a wet, dirty Mayo stand or table.

Q. Do you feel that shoes worn by the doctors outdoors should be changed when they enter surgery?

A. Everybody entering the operating room should be made to change into clean footwear with conductive soles. This minimizes the explosion hazard and contributes to aseptic technic.

Q. Do you approve of community sterile supplies? An example, autoclaved boat of drains?

A. Community sterile supplies are a hazard and should be banished from the operating room whenever possible. The danger of contamination by careless personnel is ever present. Conversation over an open container invites contamination from spitting and coughing. Every patient deserves individually packaged and sterilized equipment. The one exception is the equipment which necessarily is kept soaking in an active germicide.

Q. For how long a period is a sterilized package considered sterile?

A. A properly packaged and wrapped package which is stored in a clean, dry, vermin-free place and is not pummelled will remain sterile indefinitely.

Q. Discuss terminal disinfection following a septic case in relation to: (a) Linen and gauze supplies (b) Nonboilable sutures, glassware and rubber (c) Instruments (d) Waste fluids (e) Isolation of room—care of walls, furniture and floors.

A. You will find a detailed discussion of terminal disinfection in Chapter 15 of "Aseptic Treatment of Wounds" published by the MacMillan Co., 1948. A colored movie depicting the technic, "Terminal Sterilization Following Septic Cases", is available from Boston University, School of Public Relations, 84 Exeter Street, Boston.

Q. As far as sterility is concerned, what is the advantage of packs over drums? If the drums are used up in a day, is there any advantage of the pack? What material do you consider best for covering packs?

A. Sterilizing drums invite over-loading; delay penetration of the contents by steam in the sterilizer, and are noisy and expensive. A properly packaged and arranged kit will provide a sterile wrapper for the table; enough supplies for a procedure arranged in the order of use, and a wrapper which allows prompt penetration by steam. A double thickness of muslin wrapped so that every portion of the package is covered by four thicknesses is a safe wrapper. You will find directions for packaging and wrapping kits and supplies in Chapter 10 of "Aseptic Treatment of Wounds."

Q. What is the approved method of sterilizing gloves?

A. Gloves should be packaged to provide a means of air clearance from the inside of the gloves. This can be accomplished by inserting a sponge between the cuffs or by means of a special wrapper made with a tongue which is inserted between the cuffs. Before placing the gloves in the sterilizer, they should be hydrated with a spray of distilled water. They are positioned in the sterilizer with the thumbs uppermost and sterilized for 30 minutes at 250°F. After sterilization, they should be allowed to dry thoroughly for 48 hours before being used.

Q. Do you approve of sterility indicators?

A. Sterility can be guaranteed more economically and consistently by careful packaging of supplies; proper loading of the sterilizer; intelligent maintenance of sterilizing equipment and provision of adequate personnel to operate the sterilizers. You will find a discussion of sterility indicators in Chapter 8 of "Aseptic Treatment of Wounds."

Q. Can commercial sodium hypochlorite be used for disinfecting floors?

A. Yes, in a 1-1000 dilution.

Q. When depending on germicidal vapor to disinfect, does the lid of the container have to be a screw-type cap?

A. No, anything which confines the vapor to the container is satisfactory.

Q. Do you recommend using an operating room indiscriminately for clean and dirty cases?

A. Yes. There is no need for quarantining a room which had had a "dirty case." With a suitable technic for disposing of contaminated linen and instruments, that room can be used again just as soon as it is emptied.

Q. Does calcium hypochlorite have any effect on rubber?

A. Not if the articles to be disinfected are not left soaking. Drop the tubing, etc. in; flush through with the solution; rinse with tap water and dry.

Q. What germicide should be used for disinfecting dry instruments?

A. No germicide will act quickly enough to be practical.

Q. Is it necessary to cover instruments being carried from the sterilizer to an operating room?

A. No, not if the floors are kept clean; the nurse is wearing a mask and nobody talks over the instruments. The air itself will not contaminate the instruments.

American College of Surgeons' Meeting

● *A record-breaking registration of more than 11,000 and an outstanding program made the 38th annual Clinical Congress of the American College of Surgeons the most successful in the organization's history. TOPICS here presents abstracts of some of the papers from the meeting.*

Colon Resection Aids Ulcerative Colitis

Charles B. Ripstein, M.D., Department of Surgery, Maimonides Hospital, Brooklyn—Primary resection of the diseased colon with ileostomy appears to be the surgical procedure of choice in cases of acute ulcerative colitis which fail to respond to medical therapy.

The operation is radical, but in removing the source of blood and protein loss, eliminating the focus of infection and toxic absorption, and forestalling the danger of perforation, it offers the patient a much better chance of survival than does ileostomy alone. When ileostomy is performed without removal of the diseased bowel, fluid and electrolyte loss is added to the patient's burdens.

An arbitrary interval of three weeks has been selected as the trial period for conservative management in these cases. If the patient does not improve in that time, surgery is performed. If complications such as hemorrhage or perforation occur, emergency surgery is indicated.

The operation of primary colectomy has been carried out in 42 patients with acute exacerbations of ulcerative colitis. Two deaths occurred, making the mortality rate for the group 4.8 percent.

Trypsin Found Effective in Thrombolysis, Inflammation

Irving Innerfield, M.D., Alfred Angrist, M.D., Alfred Schwarz, M.D., Wilfred F. Ruggiero, M.D., New York Medical College, Flower and Fifth Avenue Hospital, Research Unit of Metropolitan Hospital and the Jewish Memorial Hospital, New York City—The thrombolytic and anti-inflammatory effects of intravenous trypsin are strikingly apparent in a number of clinical conditions.

The authors studied five patients with proteus vulgaris infections of the urinary tract in order to demonstrate the efficacy of trypsin-induced augmentation of the host response in combating and overcoming highly resistant bacterial infections.

Intravenous crystalline trypsin was administered to 49 patients with acute thrombophlebitis and acute systemic inflammatory disturbances. Prompt subsidence of the signs and symptoms of intravascular thrombosis and acute inflammation was consistently observed.

Preliminary laboratory observations indicate that the mechanisms underlying these enzymatically induced re-

sponses to tissue injury produce characteristic morphologic and physicochemical changes. The morphologic changes are based upon lysis of intralymphatic thrombi, dissolution of fibrin, and liquefaction of intracapillary thrombi. Physicochemical factors include facilitation and acceleration of surface and intravascular phagocytosis; augmented intracellular proteolysis of engulfed bacteria and decreased viscosity of tissue fluids.

On the basis of these findings, it would appear that intravenous trypsin effectively lyzes intravascular thrombi and reverses acute inflammatory processes.

Plasma Substitutes Evaluated

Lamar Soutter, M.D., Assistant Surgeon and Director of the Blood Bank, Massachusetts General Hospital, Boston—Whole blood is the only adequate material we have for treating shock secondary to hemorrhage. Plasma and plasma substitutes are useful in restoring blood volume, arterial pressure, and cardiac output until whole blood can be obtained.

In hospital usage, gelatin and Periston are satisfactory substitutes for this purpose. Dextran is useful, but the possibility of its antigenicity and its greater expense render is less desirable. Serum albumin is dangerous for use in unskilled hands and is too expensive. Globin is effective if given in a larger volume than the other materials, but is more expensive.

The same reasoning applies to the use of these materials for treating non-hemorrhagic shock. Lundy has found plasma substitutes useful in treating hypotension in the operating room. If this hypotension is due to a diminished blood volume without a loss of red cells, the use of these materials could be very effective.

For treating shock in patients suffering from extensive burns which require large volumes of these materials, storage in the body becomes a problem. Therefore, irradiated plasma (or that obtained from small pools) would be the first choice, partly because of its safety and partly because of its protein content, as protein depletion soon will become a problem in these cases.

Gelatin is the best plasma substitute for treating these patients, because it offers no storage problem. Globin would have to be given in large quantities but possesses the advantage of being metabolizable. Albumin, if its administration were properly controlled, would be good also. Periston and Dextran are potentially dangerous for this purpose.

For the treatment of nutritional disorders in which depletion of the serum protein is a major factor, serum albumin, plasma, and globin would be the only effective agents, in that order.

Xenon Appears Promising as Anesthetic Agent

Stuart C. Cullen, M.D., and Charles B. Pittinger, M.D., Division of Anesthesiology, Department of Surgery, College of Medicine, State University of Iowa, Iowa City—Xenon is a colorless, odorless, tasteless, non-irritating gas present in minute amounts in air from which it is obtained as a by-product in the process of fractional distillation. Because of its relative chemical inertness, it is

neither combustible nor capable of supporting combustion. It has a high fat solubility and a high oil-water solubility ratio, which are properties of an anesthetic agent.

Xenon was investigated and appears to be innocuous when administered with 20 percent oxygen.

The potency of the gas is at least equivalent to that of ethylene and sufficient to provide stage three, first plane anesthesia in human beings. The concentration of the gas in the adrenal glands of dogs undergoing xenon anesthesia is relatively higher than the concentration in five parts of the brain or any other dog tissue studied.

An 80-20 mixture of xenon and oxygen does not inhibit guinea pig brain tissue oxidations.

Findings resulting from the clinical and laboratory observations made thus far on xenon as an anesthetic agent suggested additional studies which are in progress now or planned for the future. Should xenon become commercially available at a much reduced cost, its role in the field of surgical anesthesia appears assured.

Radiotherapy Aids in Cancer of Cervix

John Barkley Graham, M.D., and Ruth M. Graham, Memorial Laboratory, Vincent Memorial Hospital, Boston—Supplemental therapy of testosterone propionate or alpha-tocopherol will potentiate the effectiveness of radiotherapy so that patients with an initially unfavorable cytologic response will develop a favorable cytologic response. Whether improvement in the cytologic appearance will be accompanied by a higher cure rate remains to be seen.

Fluid Gelatin More Effective as Plasma Volume Expander

John W. Thomas, M.D., Herndon B. Lehr, M.D., and Jonathan E. Rhoads, M.D., Harrison Department of Surgical Research, School of Medicine, University of Pennsylvania, and the Surgical Clinic, Hospital of the University of Pennsylvania, Philadelphia—Tourtelotte of the Knox Company recently has altered the gelatin molecule to such an extent that the gel point has been lowered to the range from 0 to 4° C. This yields a solution that remains fluid under ordinary conditions and still exerts sufficient osmotic pressure to make it effective as a plasma expander. This material is a three percent gelatin solution in 0.7 percent sodium chloride and is called "fluid gelatin."

Fluid gelatin was administered intravenously to 92 surgical patients. Close observation was made for reactions and changes in vital signs in the first 75 patients. Twenty-two percent showed an increase in temperature of one to 2.8° F.

One patient developed a transient chill and tachycardia not associated with subsequent febrile reactions. Most of the subjects had smaller or greater fluctuations in temperature before the infusion.

In general, the changes in vital signs observed after fluid gelatin were felt to be due to the patient's illness, rather than to the infusion. Reactions such as skin rash, phlebitis, and pulmonary edema did not occur. Hematocrit determinations in 15 patients indicate that mild hemodilution occurs after infusion of fluid gelatin.

Results with Collagenase on Infected Wounds and Burns

S. C. May, M.D., S. E. Ziffren, M.D., R. E. Kallio, Ph.D., and A. D. Larson, Departments of Surgery and Bacteriology, College of Medicine, State University of Iowa, Iowa City—Collagen is notably resistant both to solution and to digestion by almost all proteolytic enzymes. The possibility of using collagenase, an enzyme whose specific substrate is collagen, was therefore considered.

A good source of this enzyme is *Clostridium histolyticum*, an anaerobe frequently found with other Clostridia in gas gangrene but rarely found alone in human infections.

One great obstacle to the action of the enzyme is the difficulty of placement of the material in the area so that it can be brought into effective contact with its specific substrate, collagen, without spreading its solubilizing activity into adjacent healthy tissue. Applying the enzyme to the surface of a burn eschar has proved ineffective. In a burn it must reach the fibers beneath the eschar. Two methods are available: (1) to inject it beneath the eschar, or (2) to cut the eschar in various places, so that if a wet dressing of the enzyme or a gel containing the enzyme is applied, it will have a chance to effect its action.

Another problem is the antigenic quality of the enzyme. Injection of the enzyme creates antibodies in a short time, thus rendering it ineffective after this period has been reached. Antibody development in humans and animals undergoing treatment with collagenase is being investigated.

It appears that the greater the concentration of collagenase brought to bear at a point, the greater its effect. When crude preparations are used in which the collagenase has a lower concentration, more of the preparation on a unit basis is required to produce a similar enzyme response.

Intra-Arterial Transfusion Used in Treating Trauma

Brig. Gen. Sam F. Seeley, M.D., Chief of Surgical Service, Walter Reed Army Hospital, Washington—Intravenous transfusion may suffice during the stages of mild or moderate shock. Intravenous transfusion cannot be expected to suffice in profound shock, especially where the pulse and blood pressure cannot be discerned, principally because blood administered intravenously must be transferred through the pulmonary circuit before reaching the arterial circulation.

Arterial administration of blood, plasma, and other substances brings about prompt restoration of blood pressure and tissue perfusion. The rate of administration depends upon the amount of blood required to fill the arterial tree to a point at which pressure is exerted against the elastic arterial walls. Facilities for arterial transfusion should be available in every operating room in which major surgery is performed.

The apparatus is simple; the administration of blood can be prompt and is highly effective when there is no demonstrable blood pressure, or even when the heart has stopped beating. This is due primarily to successful perfusion of the coronary vessels.

The Problem Clinic

by EDITH DEE HALL R.N.

● A regular monthly feature set aside for the discussion of administrative problems in the O.R.

Q. The instruments we use for eye surgery are kept in a separate glass instrument cabinet. Most of these instruments are made of stainless steel and give us no trouble. We do have trouble preventing dust on the others especially during the summer months when the humidity is high. Can you suggest a means of eliminating this problem?

A. Your drug department should be able to supply you with camphor gum. This is packaged in convenient two-inch squares. Place these squares on your instrument shelves and keep the cabinet doors tightly closed. The camphor gum will absorb any moisture present.

• • •

Q. Can you suggest a routine to be followed, for the care of nurses and other Operating Room personnel who may meet with an accident or become ill while on duty?

A. Transport such patients to the hospital's emergency room which is equipped to handle such cases promptly and which will also fill out proper file records. After necessary care has been given, a report should be telephoned to the Nursing Office. The Nursing Office should, in turn, call the Operating Room if the patient is unable to return to duty.

In an extreme emergency, where a loss of minutes may be hazardous, a doctor from one of the operating rooms should be summoned. Again the Nursing Office should be notified so that someone may be sent to take over the responsibility and allow the Supervisor to return to her duties. Because of compensation and insurance laws, it is important to have accurate records on all accident cases. Even though the injury be slight, unknown complications may develop.

Q. Three of my ten staff nurses are habitually late arriving on duty, but always ready to leave on time at the end of the day. Naturally I have spoken to them, but after a few days they are back in the old habit. They are good nurses, but I feel, as do the other nurses, that it is unfair. Can you suggest a solution?

A. Many nurses and employers would like this problem solved. Unfortunately there seems to be no answer. Some human beings are just never on time and no matter what the penalty, they will not change. One suggestion, if you can apply it, is to reward nurses who are punctual. Extra time off is always appreciated, as in an extra half day per month to give them an early start on a weekend or a vacation. If this cannot be done, you may think of other means of rewarding them which will work out better in your situation.

• • •

Q. I am located in a small town where I cannot advance or get added experience in operating room work. Will you please tell me where I can obtain a list of schools and the requirements for a post-graduate course in operating room technic?

A. You may secure this list by writing to the National League for Nursing, 2 Park Avenue, New York 16, N. Y.

• • •

Q. I have just received a large quantity of canvas which is to be used in place of muslin for covering goods to be sterilized. I feel that this material is too heavy. What is your opinion?

A. Canvas is used for tents, tarpaulins, etc., because of its ability to shed water. The material is heavy and the fibers are closely woven. These fibers swell when they become moist and prevent penetration of steam. Canvas, therefore, should never be used for operating room supplies that are to be sterilized. Double covers of good quality muslin are recommended.

• • •

Q. I am perplexed by the behavior of one of my staff. This person is a good scrub nurse, but is interested in her work only from the time she scrubs until the operation is completed. She takes no interest in the preparation, arrives late, and often keeps the surgeon waiting. She works a hardship on her circulating nurse in getting things ready, and also causes her unnecessary work during the operation. This causes friction which is increasing. I have been unable to discover a cause for her behavior. She offers no excuse or explanation, and although she promises to do better, the improvement is only temporary. Because of the difficulty of getting nurses, I hesitate to take more drastic action.

A. You have a real problem, for often there is no method of changing one who follows this type of behavior pattern. Your director of nurses may be able to influence and help this nurse to improve and show consideration for her co-workers. If a surgeon is inconvenienced often enough by the nurse's tardiness, he may be able to help by simply asking her to be on time. Discussing the matter with a neutral party may bring out other angles and result in helpful adjustments. If these measures fail, then the decision rests on you either to let her continue and run the risk of losing other nurses, or to ask to have her replaced.

Quotable Quotes

Excerpts from the wide span of medical and nursing literature, designed to save time for the busy Operating Room Supervisor.

Tendon Surgery of the Hand

By E. Blas Ferraiouli, M.D.

The author uses induction Pentothal anesthesia ½ percent supplemented with gas or ether, if necessary.

As soon as the patient is anesthetized a pneumatic tourniquet at 300 mg. Hg. is applied, after the arm has been kept elevated for 10 to 15 minutes.

With this type of tourniquet the ischemia can be maintained safely for 2 or 3 hours, although it is best to release the tourniquet every hour for five minutes and reapply it.

The skin is then prepared, using tincture merthiolate 1:1000. Thorough excision of unclean traumatized tissue is essential. The incision should be well planned to have adequate exposure and the least scarring. A finger should be opened by a mid-lateral incision and not by anterolateral, mid-dorsal or mid-volar incisions.

On the palm of the hand there are three major folds, which if crossed, lead to contractures. The flexor tendons at the palm may be completely exposed by an L shaped incision paralleling the distal crease and turning at an obtuse angle at the base of the palm. Incisions in the back or front of the wrist will become invisible if they conform to the creases and can be made transversely or horizontally. In general, an L or S shaped incision heals best.

When both superficial and deep flexor tendons are cut at the finger, the deep tendon should be repaired alone, and the sublimus disregarded, because if both tendons are sutured they will adhere to each other.

Fascial sheaths in the proximal segment of the fingers should also be split laterally and not anteriorly when repairing tendons.

When flexor tendons are cut in the palm proximal to the annular sheath over the metacarpal head, both superficial and deep are sutured and good results are obtained.

In the thumb when the long flexor tendon is injured over the proximal phalanx, the incision should never be extended along the thenar eminence. The tendon should be identified at the wrist and then threaded backwards.

Injuries of the flexor and extensors tendons at the wrist are very successfully repaired. In injuries of extensor tendon over the dorsum of the finger, usually good results are obtained. Fair result is obtained in spite of good surgery if the tendons are lacerated at the muscular-tendinous junctions.

Tendon gaps should be covered with tendon grafts, obtained by using the palmaris longus or the extensors to the four small toes. *(From Boletín de la Asociación Médica de Puerto Rico, Vol. XLIV, No. 1, January, 1952).*

Surgical Treatment of Carcinoma of the Cervix

Langdon Parsons, M.D., Boston, Massachusetts

Surgery has a definite but limited place in treating cancer of the cervix. Radiation remains the basic therapy.

Candidates for surgery as primary treatment should be excellent risks and the disease limited to the cervix or immediately adjacent vaginal wall.

When surgery is employed, surgical procedure must be adequate. A total hysterectomy with or without node dissection cannot be regarded as sufficient.

Retroperitoneal node dissection performed after complete radiation, may, although experimental, prove valuable in future treatment plans. For advanced or previously irradiated cases the pelvic exenteration procedure should be regarded as experimental. *(From Connecticut State Medical Journal, Vol. 16, No. 3, March, 1952, pp. 155-59).*

Emergency Care of Eye Injuries

By Windsor S. Davies, M.D.
Detroit, Michigan

First aid treatment of chemical ocular burns is of paramount importance. The most effective treatment is thorough irrigation with water.

The eyeball and conjunctival sac should then be carefully investigated, searching for chemical irritants which may be imbedded and which should be removed. Acid burns usually show an immediate and sharp demarcation as to their extent. Alkali burns, on the contrary, may cause continued destruction.

Neutralization of severe burns by the use of acids in the case of alkali burns and of alkalis in the case of acid burns is unwarranted.

Following the emergency irrigation and inspection, the eyeball is anesthetized with 0.5 percent pontocaine or similar ocular anesthesia, and then again irrigated copiously with normal saline or water for five or ten minutes.

The extent of a corneal burn is determined by installation of two percent buffered fluorescein solution.

The conjunctival sac may then be filled with ophthalmic hydrosulphasol. A pressure bandage is lightly applied to both eyes, and the care of the burn is continued under the direction of an ophthalmologist.

Arsenical burns such as may be caused by Lewisite are decontaminated specifically by an installation of five percent BAL "dimercaprol" in the form of an ointment or in an ethylene glycol solution.

Imbedded corneal foreign bodies are removed following installation of 0.5 percent pontocaine. If the foreign body

is deeply imbedded, this may necessitate the use of a spud to remove the particle. When the imbedded body is in the visual axis, care must be exercised to avoid excessive trauma.

The use of local antibiotic ointments following removal may be indicated.

Where injury to an eyelid results in exposure of the cornea, it is most important to protect the cornea from drying by the copious application of a lubricant or a mild ophthalmic ointment.

Where inspection reveals that the sclera or cornea has been lacerated, a sterile binocular dressing should be applied. No irrigation should be attempted before the lesion is properly evaluated. An important early treatment of penetrating ocular wounds is the administration of tetanus antitoxin.

A common injury from flying debris is the presence of an intraocular foreign body. This possibility should always be suspected where eye trauma has occurred. Such patients should have both eyes bandaged for transportation. *(From The Journal of the Michigan State Medical Society, Vol. 51, No. 3, March, 1952, pp. 338-39).*

Bacteriologic Survey of Scrub Technics*

Andrew J. Canzonetti, M.D., and Marion M. Dalley, B.S., New Britain, Connecticut

Scrub technic studies demonstrated the inadequacy of the routine soap and water scrub. When coupled with a one-minute soak in 1:1000 solution of aqueous Zephiran hydrochloride it became an effective surgical scrub. Its efficacy was not comparable, however, to either pHisoderm and G-11 alone or to a combination of pHisoderm, G-11 and a Zephiran soak.

Studies made of bacterial conditions following breaking of the Zephiran film with regular soap also revealed a mass of bacteria which was shielded by the film. The wearing of gloves caused an increase in bacteria in almost all instances, although bacterial proliferation was diminished by the addition of Zephiran and was almost completely inhibited in many instances by the pHisoderm, G-11 and Zephiran routine.

For practical purposes the preoperative preparation of the surgeon with pHisoderm and G-11 followed by a one-minute soak in Zephiran has the following advantages:

A. Effective degermation—sustained through wearing of gloves for at least one hour.

B. Ease of management and shortening of scrubbing time.

C. Absence of allergic reactions in our experience involving continuous use over one year without a case of allergy.

D. Increased safety to surgical patient.

E. Moderate cost.

* The pHisoderm with 3 per cent G-11 was made available through the courtesy of Mr. A. Richards of Winthrop Stearns Co. *(From Annals of Surgery, Vol. 135, No. 2, February, 1952, P. 228.)*

Anesthesia in the Rural Hospital

What are the most practical methods for the small hospital with limited equipment? Bennet, in the *Manitoba Medical Review*, June-July, 1952, offers a number of suggestions which should prove of value.

Where a gas machine is not available for resuscitation, ether is still considered the safest anesthetic. An important safety feature is the fact that ether is the only anesthetic agent which stimulates respiration. As to its disadvantages, certain methods are available to overcome these.

For induction, 2½ percent sodium pentothal is ideal, since it gives excellent basal anesthesia for an ether anesthetic. A 19 or 20 gauge needle is used for the venipuncture, and a test dose of three to five cc. of the pentothal solution is injected. After a minute, if the patient is not asleep, a second dose of 3 cc. is injected, and repeated every minute until the patient is asleep. Quicker induction may occasionally be advisable, but usually this slow method is safer.

Ether is then begun in an open mask, with the strength increased as the patient tolerates it.

Tracheal intubation is not difficult, and will aid in providing good relaxation and quiet breathing without keeping the patient too deep. The blade of the laryngoscope is inserted over the tongue, with the tip passing in front of the epiglottis, lifting the epiglottis and exposing the larynx. The tube is introduced into the larynx about 1½ inches, and is anchored with adhesive tape. The mask is then replaced. Oxygen given with ether anesthesia will provide better postoperative results.

When adequate relaxation is not provided by intubation, one may employ small doses of curare or curare-like drugs, having at hand Prostigmine or Tensilon as an antidote.

For resuscitation, a modified mouth-to-mouth method may be employed, using the mask from a gas machine, or a resuscitator may be used.

Device for Assisted Respiration. II

James V. Maloney, Jr., M.D., William S. Derrick, M. D., and James L. Whittenberger, M.D., Boston.

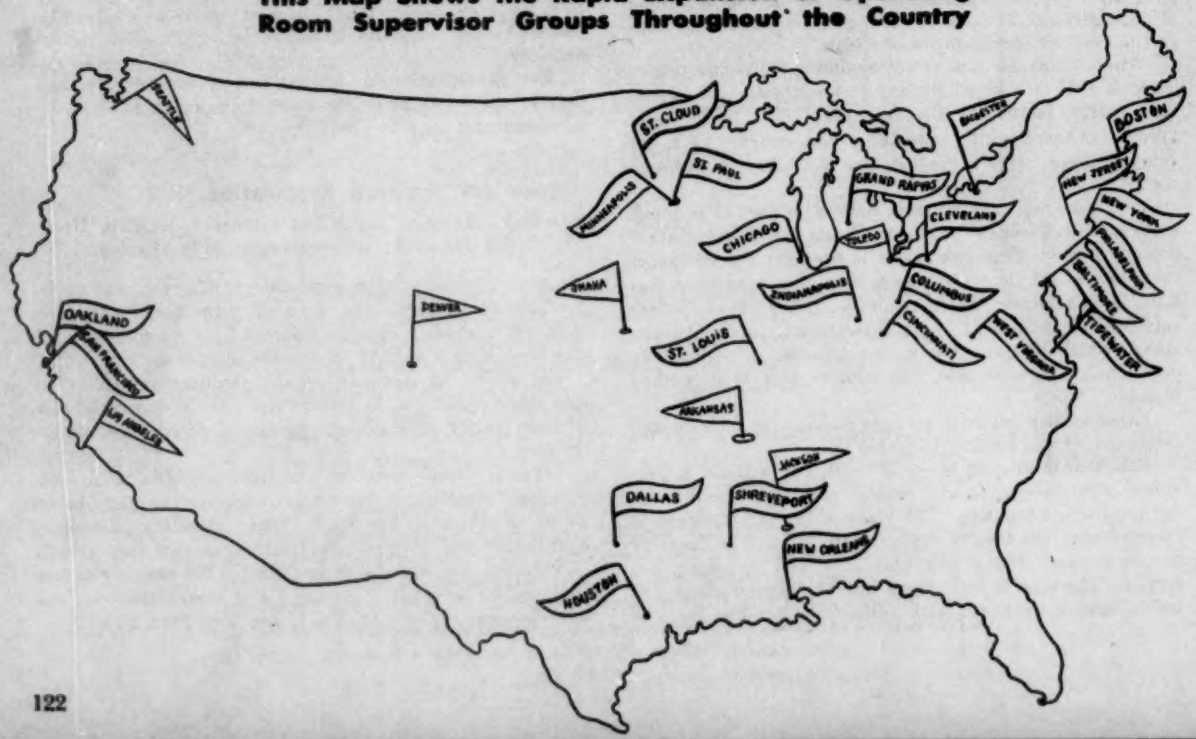
Severe pulmonary hypoventilation is common during intrathoracic surgery. The reduced pulmonary ventilation occurred regularly in cases handled by a number of anesthetists using a variety of anesthetic agents.

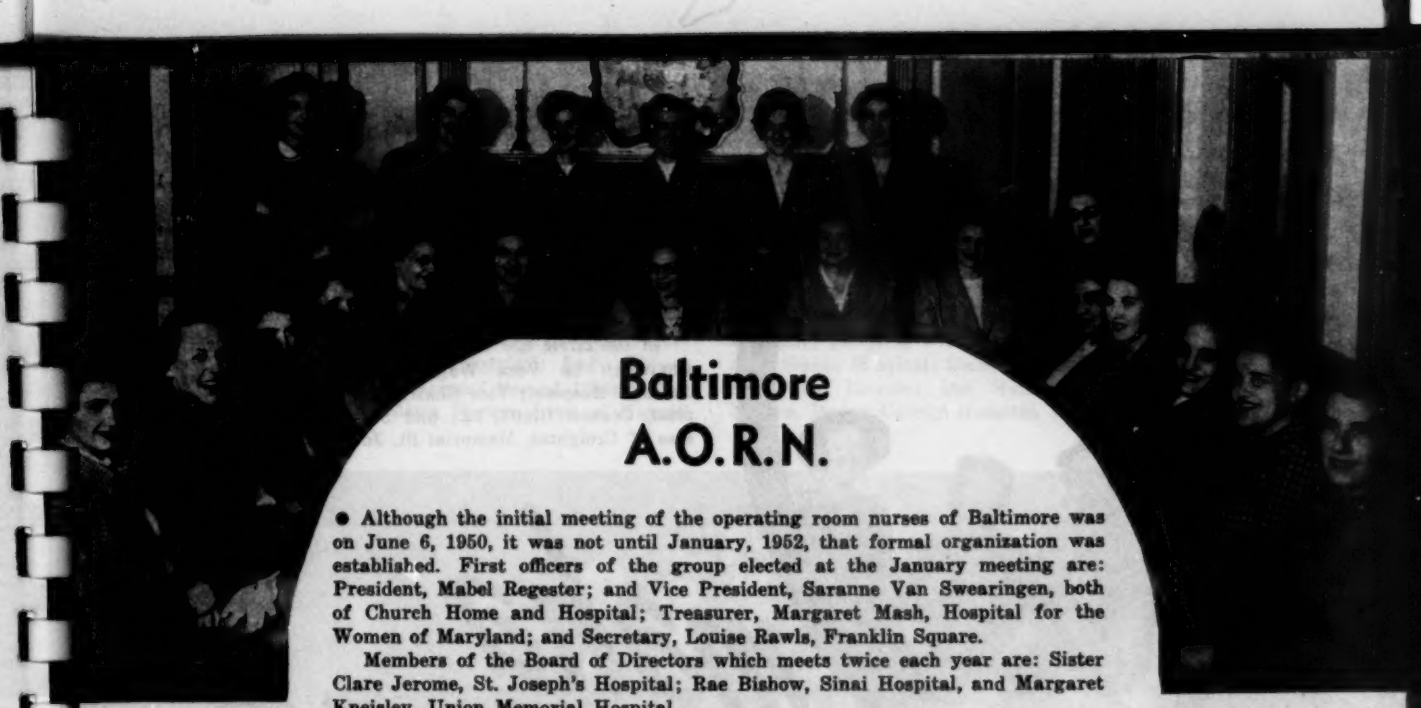
A device is described which produces regulated inspiratory assistance to respiration. An incorporated ventilation meter continuously measures pulmonary minute volume.

It was found possible with this machine to provide adequate ventilation during intrathoracic surgery in all cases in which it was used. When adequate pulmonary ventilation was obtained, mediastinal motion was greatly diminished. The apparatus described in the article was constructed by the J. H. Emerson Co. *(Abstracted from Anesthesiology, Volume 13, No. 1, January, 1952, P. 23.)*

Growth of O.R.S. Groups from Coast to Coast

This Map Shows the Rapid Expansion of Operating Room Supervisor Groups Throughout the Country





Baltimore A.O.R.N.

● Although the initial meeting of the operating room nurses of Baltimore was on June 6, 1950, it was not until January, 1952, that formal organization was established. First officers of the group elected at the January meeting are: President, Mabel Regester; and Vice President, Saranne Van Swearingen, both of Church Home and Hospital; Treasurer, Margaret Mash, Hospital for the Women of Maryland; and Secretary, Louise Rawls, Franklin Square.

Members of the Board of Directors which meets twice each year are: Sister Clare Jerome, St. Joseph's Hospital; Rae Bishow, Sinai Hospital, and Margaret Kneisley, Union Memorial Hospital.

Since that first meeting in 1950, nurses have met informally each month. They soon discovered that this meeting provided an opportunity to pool their experience and knowledge and discuss subjects pertinent to operating room nurses.

It is the hope and aim of the Baltimore Association to interest as many nurses as possible and to encourage them to contribute from their own knowledge and experience so that mutual assistance and understanding may aid in developing better nursing service and a feeling of friendship and good will among operating room nurses and supervisors throughout the city.

NEW Omaha O.R. GROUP

● Operating room nurses from the Omaha, Nebraska, area met recently to make plans for an Association of Operating Room Nurses. The organizational dinner, held at the Blackstone Hotel in Omaha, was attended by twenty-five surgical nurses and four representatives of nursing groups. Tentative officers were appointed to establish the laws of the organization.

In the circle are the officers. From left to right are: Chairman La Vera Wagner, Creighton Memorial St. Joseph's Hospital; Vice Chairman Ann Meis, Mercy Hospital, Council Bluffs, Ia.; and Secretary Hazel Goettsch, also of Creighton Memorial St. Joseph's Hospital.

Members in the group below are, front row left to right: Vernelle Erickson and Helen Haas, Memorial Hospital, Westpoint; Maria Moore, Veterans' Hospital; Dorothy Patach, Wanda Swenson and Kathleen Christensen, Bishop Clarkson Hospital; Frances Zimmerman, Jennie Edmundson Hospital, Council Bluffs, Ia.; Ann Meis and Ina Smith, Mercy Hospital, Council Bluffs; Wanda Kaffel and Barbara Vaage, Immanuel Deaconess Hospital; Gertrude Beaver, Bishop Clarkson Hospital; Sadie Peirce, Methodist Hospital; Clara Siemsen; Second District Nebraska Nurses' Assn. and Alma Norum, Dept. of Nurses' Education, Lincoln.

Standing left to right are: Charlyn Johnson and Patsy Cleveland, Children's Hospital; Laura Wagner and Maureen Meehan, St. Catherine's Hospital; Sister Mary Odolina, Sister Mary Corneliana, Mary Anne Ruther, La Vera Wagner, and Hazel Goettsch, Creighton Memorial St. Joseph's Hospital; Evelyn Cording, Dodge County Hospital, Fremont; Marjorie Uren and Bonnie Florine, University of Nebraska Hospital; Blanche Graves, Director of Nurses' Education, Lincoln; and Hanna Schmidt, Director of Nurses, Dodge County Hospital, Fremont.

Rochester, N. Y.

Shown in the photograph are left to right first row: Jane Furman, chairman, and Zerith Issa, Highland Hospital; Elizabeth Kleiber, Strong Memorial Hospital; and Marjorie Euart, Iola Sanatorium. Second row: Eleanor Stack, Mary Ward, and Elizabeth Seeley, program chairman, all of Iola Sanaterium; Elisabeth Knight, Monroe County Hospital; Ruth Jordon, treasurer, Rochester General Hospital; and Eunice Flagg and Bernice Ward, Iola Sanatorium. Third row: Arlene Wickman, Iola Sanatorium; Kathleen Skeleton and Jean Hauch, Rochester General Hospital; and Janet Meade and Kathleen Crerar, Genesee Hospital.

● On March 10, the Rochester Association of Operating Room Supervisors and their staffs held their first program discussion at the Chamber of Commerce Building.

Encouraged and aided by the Rochester Council of Hospitals, the Operating Room Supervisors of the Rochester hospitals organized with definite objectives intended to give optimum care and comfort to the surgical patients in their charge. These objectives are as follows:

1. To increase the knowledge of new operating room technics and equipment.
2. To discuss common problems.
3. To improve inter-professional relations.
4. To stimulate growth and improvement of attitudes.
5. To interpret the aims of operating room nursing in accord with changing educational trends.
6. To improve inter-departmental communication.
7. To stimulate improvement in operating room nursing to make it more attractive to young graduates.

An ambitious program of forums with surgeons and hospitals administration, surgeons and hospital administration, pital principals and field trips are being scheduled.

DENVER

A GROUP of twenty-four Operating Room Supervisors, Assistant Supervisors and Head Nurses representing fourteen hospitals in Denver gathered at a dinner meeting January 31 to plan the organization of an Operating Room Nurses Association in Denver.

Mrs. Jane H. Trumbo, VA Hospital, led the business meeting following the dinner. The group voted that: membership should be open to all registered professional nurses engaged in operating room work; meetings would be held monthly; the official name would be the Denver Association of Operating Room Nurses; Membership, Constitution and By-Laws, and Program committees are to be appointed.

Pictured in the group above are, Front row, left to right: Mrs. Sarah Jones, Presbyterian Hospital; Miss Conter, Mercy Hospital; Irene Reiter, VA Hospital; Mrs. Jane Trumbo, VA Hospital; Wilda Rush, Colorado General Hospital; Lt. Cloe, and Lt. Mary Beecher, Lowry Air Force Base Hospital.

Back row, left to right: Ruth Burkholder, Beth Israel Hospital; Louise von Ruccau, National Jewish Hospital; Mrs. Mary Downing, National Jewish Hospital; Mrs. Juel Werts, Denver General Hospital; Lucielle Rykken, Denver General Hospital; Marguerite Krieger and Mrs. Bonita Ceperly, General Rose Memorial Hospital; Mrs. Louise Barish, St. Anthony's Hospital; Mildred Tripp, St. Luke's Hospital; Adrienne Neumann, St. Anthony's Hospital; Mrs. Bertha Mosconi, Jewish Consumptives Relief Society Sanatorium; Mrs. Mabel Kennedy, Children's Hospital; Mayme Siebels, Children's Hospital; Mary Klein, Porter Hospital and Sanitarium; Mrs. Leona Hittle, Presbyterian Hospital; Mrs. Alberta Eichman, Porter Hospital and Sanitarium.

TOLEDO Forms A.O.R.N.

A newly formed A.O.R.N. is in Toledo, Ohio. Above: members sit for their official photograph. L. to r. they are: First row: D. Neiman, Secretary, Maumee Valley Hospital; H. Huffman, President, Mercy Hospital; B. J. Hostetter, Vice President, St. Vincent's Hospital; V. Baker, Treasurer, and M. Gottfried, Toledo Hospital; Second row: M. David, Maumee Valley Hospital; D. Barkenquast, Toledo Clinic; J. Galambos and K. Banks, Flower Hospital; E. Howerton, Toledo Hospital; and D. Hanna, St. Vincent's Hospital. Third row: E. Dippman, and R. Howe, Mercy Hospital; P. Tuck, and J. Heine, William Roche Memorial Hospital; J. Groll, and S. Heck, Toledo Hospital. Fourth row: F. Huffman, St. Luke's Hospital; D. Raczkowski and S. Haberkomp, Mercy Hospital; A. Dermer, St. Vincent's Hospital, and E. Wiltse, St. Luke's Hospital. Fifth row: L. Lasca, Mercy Hospital; B. Jones, St. Vincent's Hospital; B. Paxton, St. Luke's Hospital; B. Kenzler and T. Kassmann, St. Vincent's Hospital.

● Twenty-four operating room supervisors met in Los Angeles, April 30 to organize an Association of Operating Room Supervisors. Business for that first meeting was getting acquainted and making plans for another meeting. A committee was selected to make arrangements for a second meeting and also to select a speaker. Officers for the Los Angeles A.O.R.N. will be elected at that meeting.

Above: members of the group sit for a photograph following the meeting. They are standing from left to right: Ruth Nagel Beaty, Cedars of Lebanon Hospital; Catherine Bryan and Antoninette M. Jourdan, both of Huntington Memorial Hospital; Ruth Lindgrin and M. Miller, both of VA Hospital, Sawtelle; Ora Knutson, Glendale Community Hospital; Mary Gattis, Temple Hospital; S. Burns, Hollywood Presbyterian Hospital; and C. Castro, Temple Hospital.

Seated left to right are: Marie G. Brotherton, Children's Hospital; Gayle Hawken, California Hospital; Ethel West, Methodist Hospital; Mary Major, California Hospital; Vivian Warren, White Memorial Hospital; Francis Arnet, Glendale Sanitorium and Hospital; Genevieve Westphal, Beherns Memorial Hospital; Lillian Yeskett, Santa Monica Hospital; Viola Roddewig, and Trudy Harte, Beverly Community Hospital; Edna Curtis and Mabel Crawford, Good Samaritan Hospital; Helen Pearson, Cedars of Lebanon Hospital; Betty Behrendt, Santa Fe Hospital; and Margaret Dever, Saint Vincent's Hospital.

LOS ANGELES

Three New A.O.R.N.s Formed

Operating Room Supervisors in the East, South, and Far West Get Together to Organize Groups

● The Greater Cincinnati Association of Operating Room Nurses held its first meeting at the Good Samaritan Hospital, May 15, with 42 nurses present. Problems common to all O.R. nurses were discussed with special emphasis made on a presentation and general discussion of "Terminal Sterilization Following Septic Cases". In order to promote actual participation of all members of the group, it was decided that each nursing team should present programs at the meetings held in their respective hospitals.

Members of the group shown above are, first row, l. to r.: A. Walker, E. Kenealy, R. Morris, St. Mary's Hospital; Lelia Meyer, Deaconess Hospital (president); Devona Langley, St. Mary's Hospital (vice-president); Mildred Wilch, Christ Hospital (secretary); Bertha Lotterer, Jewish Hospital (treasurer); Jean Hellmann, St. Elizabeth's Hospital, Patricia Nicholson and Jane Nassano, Booth Memorial Hospital.

Second row: Polly Leroy, Children's Hospital; Claire Holmlin, Christ Hospital; Jacqueline Wild, Deaconess Hospital; Harriet Ricky and Virginia Wilson, Good Samaritan Hospital; Sister Mary George, Our Lady of Mercy Hospital; Sister Anna, Good Samaritan Hospital; Audrey Patterson, Gretta Lee Waltz, and Rena Stepp, Daniel Drake Memorial Hospital.

Third row: Mildred Lehnhoff, Good Samaritan Hospital; Martha Winklepleck, Children's Hospital; Marilyn Ross, Daniel Drake Memorial Hospital; Mary Dangers and June Toennis, Bethesda Hospital; Lois O'Banion, Mary Jane French, and Ruth Fremont, Jewish Hospital; Julia Meyerchak, Wilma Meehan, and Mary McDonough, St. Elizabeth's Hospital; and Lillian Regan, Cincinnati General Hospital.

Fourth row: Eleanor Mullooly, Good Samaritan Hospital; Ruth Wright, Daniel Drake Memorial Hospital; Esther Wadsworth, Cincinnati General Hospital; Ruth Smith and Betty Gullion, Bethesda Hospital; Eleanor Ashe, Kathryn Kochton, Jewish Hospital; Jean Van Houten and Ruth Kleymeyer, St. Elizabeth's Hospital, and Ethylene Price, Cincinnati General Hospital.

CINCINNATI

JACKSON

● The A.O.R.N. of Jackson, Miss., has made plans to meet bi-monthly and also to have a program for O.R. nurses at the state nurses' meeting. During their first business session they elected officers and discussed programs of future meetings.

Members of the group shown below are, front row, l. to r.: Iva D. Hollingsworth, St. Dominic Hospital; Joyce Thomas, Mercy Hospital-Street Memorial, Vicksburg; Blanche Smith, Veterans Hospital (vice president); Annie Lou Tucker, Mississippi Baptist Hospital (secretary); and Julia Clark, Veterans Hospital, Gulfport, (treasurer). Second row: Madeline Nickolas, Christine Weatherley, Newton Smith, Betty Jane Hanop, and Lois Kennard, all of Veterans Hospital; Sister Teresita, St. Dominic Hospital; Mildred Puckett, Veterans Hospital, and Ruth Thornton, Mercy Hospital-Street Memorial, Vicksburg. Third row: Sister Mary Dominicus, St. Dominic Hospital; Catherine Hovious, Rush Memorial Hospital, Meridian; Mrs. John Henley, Mercy Hospital-Street Memorial, Vicksburg; Marion Fosberg, Emily McAdory, and Frances Moody, Mississippi Baptist Hospital; Eva Y. Gadue, Veterans Hospital, and Dorothy Field, Mercy Hospital-Street Memorial, Vicksburg. Sister Noel, Mercy Hospital-Street Memorial, was elected president, but was unable to attend the meeting.

SEATTLE

● Off to a good start, the Seattle O.R. Supervisors gathered at the Olympic Hotel June 5 to organize an A.O.R.N. Meetings are to be held once a month in the different hospitals. All operating room nurses are eligible to join.

Above: attending the first meeting were, seated l. to r.: Nona Hancock, Maynard Hospital (treasurer); Margaret Malcolm, Childrens Orthopedic Hospital; Elizabeth Bruggeman, Swedish Hospital (president); Bertha Patrick, Virginia Mason Hospital (vice-president); Margaret Williams, Columbus Hospital; Mrs. Alyce Ekstrom, Doctors Hospital; and Margaret Anderson, Group Health Hospital (secretary). Standing are: Gertrude Moore, U. S. Marine Hospital; Carole Erickson, North Gate Hospital; Maxine Freese, U. S. Veterans Hospital (program chairman); Margaret Leitch, Providence Hospital; Pearl Hamilton, Harborview Hospital (publicity chairman) and Jeanne Doctor, Ballard General Hospital.

Arkansas A.O.R.N. Reports Progress

● Members of the Northwest Arkansas Association of Operating Room Nurses met recently in Rogers, Ark., to celebrate six months of successful organization and accomplishment.

Officers elected for the 1952 term are shown above. President is Betty Robinson (center), ORS, Washington County Hospital, Fayetteville; vice-president, Mrs. Virginia Howard (right), ORS, Veterans Hospital; and secretary-treasurer, Mary Lou Dixon, also of Veterans Hospital.

The group will meet the third Wednesday of every month with each of the seven hospitals represented, taking a turn at being host.

Members shown below are, seated left to right: Mrs. Elsa M. Juhre, Bates Memorial Hospital, Bentonville; Sister Mary Roberts, O.P., Rogers Memorial Hospital, Rogers; Mrs. Howard; Miss Robinson; Miss Dixon; Sister Rita Rose, O.P., Rogers Memorial Hospital, and Dorothy Castle, Veterans Hospital.

Standing, left to right, are: Mrs. Mary Ann Huges, Rogers Memorial Hospital; Peggy Terpening, Washington County Hospital; Mrs. Theda Leonard, Veterans Hospital; Mrs. Pearl Walker, City Hospital, Fayetteville; Gertrude Grosshuesch, Veterans Hospital; Mrs. Nita Talbert, Veterans Hospital; Mrs. Mamie McChristian, City Hospital; Mrs. Edna Morelock, City Hospital; Mrs. Elma Mae Gojsza, Washington County Hospital; Mrs. Irene Crigger, Washington County Hospital; Mrs. Helen Johnson and Mrs. Verna Hudson, Memorial Hospital, Silam Springs; and Lucy Heagler, Springdale Memorial Hospital, Springdale.

Pittsburgh A.O.R.N. Celebrates Second Anniversary

THE OFFICERS AND BOARD MEMBERS

● The A.O.R.N. of Pittsburgh met June 4 for their second annual banquet. Sixty nurses attended to celebrate another successful year of organization and accomplishment.

Officers for the 1952-53 year were elected at the meeting. Shown at the right are, back row, l. to r.: Elizabeth Wolfe, president, Presbyterian Hospital; Catherine Fairley, vice-president, Allegheny General Hospital; Patricia Ciocca, secretary, and Blanche M. Ivory, treasurer, both of Veterans Administration Hospital, Aspinwall, Pa. Front row: three members of the board of regents, Jean Fialka, Allegheny General Hospital; Catherine Marburger, Presbyterian Hospital; and Eunice Rowse, Washington (Pa.) Hospital.

To improve the educational program this past year the group held each of its monthly meetings at a different hospital. The hostess hospital was responsible for a program that would be beneficial to the group.

Above: Officers and directors are, l. to r.: Anne Blair, vice-president; Edythe Angell, director; Sophia Larson, president; Ruth Wolford, secretary; Nellie Tampson, director; and Sylvia Reed, director.

Cleveland A.O.R.N. Reflects on Two Years

● In June, 1950, seven operating room supervisors representing seven Cleveland hospitals met at the Hotel Statler to hear Edith Dee Hall, founder and first president of the New York Association of Operating Room Nurses, discuss organization of an A.O.R.N. in Cleveland. Several informal meetings of the group followed during the summer.

The Greater Cleveland Association of Operating Room Nurses was officially organized at St. Luke's Hospital in September, 1950. Josephine Tercek, assistant supervisor, St. Vincent Charity Hospital, was acting president and Catherine Baker, supervisor, Mt. Sinai Hospital, was acting secretary. On May 14, 1951, the following officers and directors were elected:

President, Sophia Larsen, supervisor, Cleveland Clinic Hospital.

Vice-president, Josephine Tercek.

Secretary, Laura Burton, supervisor, Huron Road Hospital.

Directors were Annabelle Beal, supervisor, Crile VA Hospital; Edythe Angell, supervisor, University Hospitals; Catherine Hawk, supervisor, Grace Hospital; Sylvia Reed, supervisor, City Hospital, and Catherine Baker.

Re-elected for the 1952-53 term of office were Sophia Larsen as president and Mrs. Laura Burton as treasurer. New officers are: vice-president, Ann Blair, instructor, St. Luke's Hospital, and secretary, Ruth Wolfert, supervisor, Lutheran Hospital.

New directors for 1952-53 are Nellie Tampson, staff nurse, Cleveland City Hospital, and Jane Urban, supervisor, Fairview Park Hospital. Annabelle Beal, Edythe Angell and Sylvia Reed were retained as directors.

Denver A.O.R.N. Elects Officers

● Elected for the 1952-53 term of office of the Denver A.O.R.N. are from l. to r.: Alice Mikawa, recording secretary, General Rose Memorial Hospital; Lorene Crosby, corresponding secretary, Denver General Hospital; Lucille Rykken, board member, Denver General Hospital; Mrs. Jane H. Trumbo, president, Veterans Administration Hospital; and Mildred Tripp, vice-president, St. Luke's Hospital.

Reno Celebrates First Anniversary

The A.O.R.N. in Reno, Nevada, recently held a first anniversary dinner in celebration of its founding. Attending the dinner were, standing l. to r.: S. Klaich, R. Rogers, Mrs. E. Rea, Mrs. B. Fischer, Mrs. E. Bryson, Dr. V. A. Salvadorini, Mrs. E. Martin, Mrs. Maida Pringle, and Mrs. F. Sheahan. Seated l. to r.: M. Kaminaka, E. Young, F. Robinson, M. Burks, C. Barnett, Mrs. M. Rich, and E. Gregory. A snow storm prevented members from Carson City, Fallon, and Lovelock from attending.

Dallas A.O.R.N. Elects New Officers

THE Dallas Operating Room Association elected officers for 1952 at a meeting January 8th at Parkland Hospital. Mrs. Virginia Nelson, Baylor Hospital, will serve as president; Miss Mary K. Baskerville, Methodist Hospital, vice-president; Mrs. Mary Fox, Dallas VA Hospital, secretary; and Miss Therla Woods, Parkland Hospital, treasurer.

The Association is revising its Constitution before answering numerous requests for copies from other groups in Texas who wish to form a similar organization. The pace-setter Dallas group now has 50 members.

The December meeting of the group was a Christmas party, held at the home of June Smith, one of the members. It was primarily a social gathering, but it was decided that tags with name and hospital affiliation would be worn by all those attending the meetings to facilitate getting to know one another. The group also discussed current membership and ways of renewing interest for the new year.

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